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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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A Change of Government

THE sudden resignation of the Labour Government and its replacement by a National Government representing the three political parties indicate two points of first-rate importance. The first is that, while the Prime Minister and several of his colleagues stand for the nation as a whole, other ministers, including Mr. Henderson, prefer the narrower group interests represented by the T.U.C. This means a deep cleavage within the body of opinion that placed the late Government in power. The second point emphasised by the change is the gravity of the crisis through which the country is passing. The immediate effect of the decision of the leaders of the three parties to unite in an Administration for the sole purpose of dealing with the national financial emergency was to bring a feeling of relief to the business community. The ultimate effect on the world at large can only be gauged when the new Government has completed its task of balancing the Budget. One thing, however, is certain, and that is that the three-party Government begins what in the nature of things must be a very short life in an atmosphere of hopeful expectation among men of goodwill in every class of the community.

There is something ironical in the spectacle of the political leaders who in varying degrees must be held accountable for the country's economic ills taking upon themselves jointly and severally to enforce drastic remedies. Each of the three parties has contributed its quota to the sum of national extravagance that has so seriously threatened British credit. The spendthrift of yesterday would not be nominated by the board of a big business to be the economiser of to-day. When, however, the complexities of the political situation are taken into account, it is not easy to see what better solution could have been found than that which emerged from the week-end conferences over which the King presided with such consummate skill. It will be difficult enough as it is for the new Ministers to pass through Parliament in the necessary time economies on the scale demanded. A substantial section of one party has already made up its mind to fight any cuts in Unemployment Benefit and the social services generally, but the prestige of that section is considerably weakened by the presence of its most prominent leaders in the new Government.

The country suddenly finds itself living under an entirely different form of Government from any it has had before except in war time. The financial crisis of August, 1931, is only a degree less severe than the European crisis of 1914. The mind of the nation was made up so quickly seventeen years ago that the Government of the day found public opinion solidly ranged behind it within a few hours. The unanimity of 1914 can hardly be expected in 1931 because a great many vested interests are threatened by the economy plans of the new Government. Still, there can hardly be a doubt that a change of heart has rapidly been taking place among the mass of the population. It is at last being recognised that there is no bottomless purse for the politicians to dip into, and that the loose talk that has been current too long about the vast financial reserves possessed by Great Britain is all moonshine. What the country at large wants to know is whether its own change of heart finds an adequate reflection in the temper of the party leaders who are now charged with its destinies. There is an opportunity to-day that will never recur for a bold policy of ruthless retrenchment without which British credit cannot be maintained, business cannot revive, and unemployment cannot be reduced.

With bitter experience of political manœuvres in the past, the business community must hold itself in readiness for strong and united action if the new Ministers do not live up to their professions. They have the chance of a lifetime. They will be trusted only so far as they show courage and disinterestedness in putting the National House in order. The most resolute determination to use every weapon available to restore British finance and save British credit is the

vital need of the time. Every man who has a stake not only in the fortunes, but in the good name of his country, will fervently pray that such a determination may be forthcoming.

The Nitrogen Battle

It still seems probable that we are in for a struggle between the producers of natural and synthetic nitrogen. Since the recent breakdown of negotiations, rumours have been in circulation that discussions had been resumed with a view to an international agreement on prices and markets, but from an official statement issued this week by Imperial Chemical Industries, these give an erroneous impression of the position. Some of the facts, however, seem quite clear. First of all, an arrangement has been arrived at between the German and the Belgian Governments by which modifications are made in certain commercial treaties between those countries, so that each Government is now free to prohibit the importation of all nitrogenous fertilisers. It is understood that both Governments have, in fact, prohibited the importation of all forms of nitrogen except under licence.

It is understood that some of the leading representatives of the Chilean nitrate industry have lately been in session in Brussels and have had informal conversations with representatives of the Belgian synthetic nitrogen industry in regard to home prices in Belgium for the coming season. There has been, however, according to the statement issued by Imperial Chemical Industries, no resumption of negotiations for a general agreement, and in view of the causes of the rupture at Lucerne and the present situation, it is considered improbable that such negotiations will be resumed in the near future. As our market reports have shown, the prices of sulphate of ammonia (the greater part of which is now the synthetic product) have been dropping of late, and the announcement of the new season's prices of nitrate of soda is still delayed. It is difficult to see how, while productive capacity remains so far in excess of consumption, competition can be avoided between the Chilean producers and the synthetic producers, and it remains to be seen whether the import-under-licence system already adopted in Germany and Belgium will be extended to other countries producing their own synthetic nitrate.

Chemical Industry's Attitude

Although there has not been time to collect detailed opinions on the change of Government among leaders of British chemical industry—many of whom are away on holiday—the general opinion appears to be distinctly favourable. This may not amount in many cases to much more than a feeling that, in the present circumstances, any change must be one for the better. Apart, however, from the psychological effect, opinions are fairly definite on two points. Our insistence for months past on the urgent need of national economy has met with a wide response throughout the industry, and hopes are generally expressed that wasteful expenditure will be promptly cut down to the level of income. Looking beyond the life of the new Economy Cabinet, there is considerable speculation as to future policy. With the exception of the merchanting community, who represent the traditional Free Trade policy, it would probably be found that the chemical industry favours a moderate tariff policy. The recent discussions on the effect of a licensing system on a national industry like dyestuffs have familiarised the industry with certain sides of the problem and no doubt influenced opinion. But it is realised that this must be a matter for the future. The immediate need is the axe and a strong hand to apply it.

The American Chemical Position

It is notable in times of difficulty how closely the conditions in the United States correspond to those in this country. Here, for example, is our contemporary, *Chemical Markets*, of New York, frankly declaring that, although President Hoover's war debt moratorium has administered "a spanking dose of physiological tonic to a sick world," the futile hope of any economic miracle has, in the meantime, died. The trick, it says, of restoring prosperity "could not be cleverly turned, by any universal debt cancellation, by a quick and sure redistribution of gold, by flattening all the tariff walls, or by a rise in prices or a readjustment of land value, or a cut in wages." Recovery is to be not a rebound but a reconstruction. The new business structure is to be built upon a new and lower price level, and "the chemical industry, converter of the earth's raw materials into the raw materials of all industries, will lay the cornerstone." Lower chemical production costs, higher chemical sales efficiency—that way American chemical and industrial salvation lies. How far, we wonder, would the heads of British chemical industry accept this simple formula as the strait and narrow way to prosperity.

Books Received

Qualitative Chemical Analysis. By Louis J. Curtman. London: Macmillan and Co., Ltd. Pp. 540. 16s.

The Use of Arylcarbimides in Identifying Hydroxylic Compounds. By G. T. Morgan and A. E. J. Pettet. Reprinted from the Journal of the Chemical Society. Pp. 4.

Application of Low-Temperature Tar in the Production of Phenol-Formaldehyde Resins. By G. T. Morgan and N. J. L. Megson. Reprinted from the Journal of the Society of Chemical Industry. Pp. 4.

Wave-length Tables for Spectrum Analysis. Compiled by F. Twyman and D. M. Smith. London: Adam Hilger, Ltd., Pp. 192. 14s. 6d.

Economic Conditions in Chile (1930). Department of Overseas Trade. Report by E. Murray Harvey. London: H.M. Stationery Office. Pp. 102. 3s.

The Calendar

Sept. 6–12	International Association for the Testing of Materials: First Congress.	Zürich.
8–9	Ceramic Society (Building Materials Section): Autumn Meeting.	Leicester.
14–15	Institute of Metals: Annual Autumn Meeting	Zürich.
18–21	Association of Special Libraries and Information Bureaux: Eighth Annual Conference.	Lady Margaret Hall, Oxford.
21–23	Royal Institution: Faraday Celebrations	London.
23–30	British Association Centenary Meeting.	London.
27	Eleventh Congress of Industrial Chemistry.	Paris.
Sept. 29–Oct. 2	Iron and Steel Institute: Autumn Meeting.	Swansea.

Explosion Risks at Chemical Works

Sources of Danger in Sublimation of Organic Chemicals

A number of explosions which occurred in chemical works during the past year are referred to in the Annual Report of the Chief Inspector of Factories and Workshops for the Year 1930, which has just been published by H.M. Stationery Office (price 2s. 6d. net).

MENTION was made in the Report for 1929 of an explosion in a salicylic acid sublimation plant; another has occurred this year at a chemical works in the Bethnal Green district, which resulted in injury to one man. Salicylic acid is sublimed by forcing a current of hot air through a bed of the crude acid placed on a suitable filter bed of asbestos and pumice. The vaporised acid passes into a chamber below the filter bed, and is there condensed in the form of fine crystals. The explosion occurred in the condensing chamber, and the cause of the ignition has not been definitely ascertained, but it is possible that it may be due to a charge of static electricity generated by the falling crystals.

Another explosion of a similar kind occurred in the Stirling district at a plant in which phthalic anhydride was being sublimed and condensed in a series of cooling chambers, and considerable structural damage resulted. The exact cause of the ignition could not be ascertained, but it may have been due to spontaneous ignition of the carbonaceous material in one of the vaporisers. Since the explosion the firm have fitted, at the top of each condensing chamber, explosion panels which, in the event of an explosion, will give way and relieve the pressure. As they were of opinion that at the time of the accident the flame passed from one chamber to another at roof level, they have also provided hanging screens of corrugated metal between the various condensers. In another plant, in which crude material of the same kind is sublimed, the firm have arranged to replace the air in the condensers by the inert products of combustion from the gas used in heating, and so reduce risk of fire occurring in the plant.

Waste Acids from Nitration Processes.

Making reference to the disastrous explosion at Castleford, Yorkshire, on which a special report has been published, it is stated that this explosion occurred in a tank in which nitric and sulphuric acids were being mixed. About 8 tons of sulphuric acid (80 per cent. H_2SO_4) had been blown by compressed air from a storage tank into the mixer, and nitric acid (97 per cent. HNO_3) was being added from a cast iron "egg," when a copious evolution of nitrous fumes occurred, followed by fire and explosion. Subsequent to the explosion, it was ascertained that the contents of a railway tank wagon containing what was thought to be waste acid from one of the waste acid storage tanks had been run, as an emergency measure, into the sulphuric acid storage tank a few days previously. Waste acid from nitration processes always contains a small percentage of nitro-body (1—3 per cent.), which gradually separates out on the surface as an oil, and this layer of nitro-body accumulates in the waste acid storage tanks and should be periodically skimmed off. This had, presumably, not been done, and it is practically certain that the contents of the railway tank wagon consisted almost entirely of this oil layer. An examination of the sulphuric acid storage tank which had supplied acid to the mixer on the day the explosion occurred was made later, and it was found to contain a large quantity (nearly five tons) of nitro-body.

There is little doubt that some of this nitro-body found its way into the mixer along with the sulphuric acid, and, as the mixer was not provided with any means of cooling, the subsequent addition of nitric acid caused a violent reaction to take place, resulting in the evolution of nitrous fumes, and an extremely rapid rise of temperature. The use of waste acid from a nitration process for making "mixed acid" should, therefore, be regarded as a nitration process and appropriate precautions taken, namely: (*a*) the nitro-body which collects in the waste acid storage tanks should be removed regularly and not allowed to accumulate; (*b*) the mixing vessel should be fitted with efficient stirring gear and adequate means for cooling; (*c*) in all such mixing plant the construction should be such that wood and other oxidisable material is excluded.

Precautions in Storage of Metallic Sodium

The District Inspector for Middlesbrough reports upon the explosion of a metallic sodium storage tank. These tanks are constructed of riveted steel plate, and had shortly before been removed from another situation, the joints having probably sprung during the removal. They were in a position where they were exposed to the weather, and rain had evidently entered, the reaction between a small quantity of water and a large quantity of sodium resulted in an explosion which blew off the door of the tank against deceased. The possibility of such an occurrence had been forecasted by previous explosions, which did not result in personal injury, and they were thought to have been due to pressure of hydrogen formed by reaction between sodium and water, and oil gauges had been fitted to indicate this. Events proved, however, that the explosions had not been due to gradual rise of pressure from hydrogen, but to sudden explosive reaction. Since the accidents the tanks have been placed under weatherproof cover and large explosion vents of sheet rubber have been fitted.

Another explosion occurred at a synthetic chemical works, where, among other chemicals, acetic acid is manufactured. The explosion occurred in the gas space of a tank which contained acetaldehyde vapour and nitrogen, but normally no oxygen. The design of the plant had, however, allowed the accidental entry of oxygen into the space by being carried over mechanically, and an explosive mixture of the aldehyde and oxygen was formed there. At first it was thought that the explosion was caused by detonation of the unstable compound peracetic acid which may have separated out in some part of the system. In the light of further research this theory is, however, no longer held, but no definite conclusion has been formed. The plant has been redesigned, with the elimination of all tanks and gas spaces, so reducing further risk of explosion to a minimum.

Air Compressors and Compressed Air Receivers

Explosions in connection with air compressors and compressed air receivers have again drawn attention to the dangers which arise from such plants and the necessity for due care in their design, construction and working. One plant involved consisted of three compressors, with the necessary pipes and receivers. All the pipes were of cast iron, and before installation (some five years ago) were subjected to a drastic hydraulic pressure test. The plant appeared to be working normally when a man working near by saw a flash and burst of the piping near one of the receivers. A hidden defect was found in one of these pipes, but most of the fractured surfaces were of good metal, and indicated that the cause of the burst lay not in the pipe itself, but in an exceptional rise of pressure. It appeared that at the last draining of the receiver (near to which the flash was seen before the explosion occurred) an excessive amount of oil was taken out. Oil in excessive amount or of too light a grade gives rise to conditions in which an oil vapour explosion may occur, but the observed facts in this case do not account fully for the explosion; possibly the igniting agent may have been drawn in from the outside. This case indicates the necessity for close control of air compressing plants, especially when cast iron piping is used.

The explosion of a three-stage compressor which was used for an air liquefying plant in central London was also investigated. Here the damaged parts of the compressor included the three copper cooling coils and the cast iron casing containing them. The casing was fitted with a brass relief disc which was blown out and failed to relieve the pressure sufficiently to prevent the bursting of the casing; the covers of the second stage delivery valve and of the intermediate chamber were fractured and the steel pipe from the high pressure delivery valve to the cooling coil was completely shattered. From the condition of some of the valves and the nature of the damage to the other parts of the compressor, it seems probable that the cause of the ignition and explosion was the common one of overheating of the compressed air due to a leaky delivery valve followed by partial "cracking" of the lubricating oil, and subsequent ignition of the resulting hydrocarbons.

On the best types of British made air compressors, mild steel plate is now used instead of cast iron for the casings of cooling coils, as the latter material is quite unsuitable for standing the sudden shock produced by a bursting high pressure coil. This compressor, however, was of foreign manufacture, and in addition to having cast iron cooler casings, it was noted that the oil separators on the first and second stages of the compressor were made with oxy-acetylene or electrically welded connections. This appeared to be a somewhat dangerous practice in view of the high pressure—600 lb. per square inch attained in the second stage.

An explosion which occurred in a plant used for drying and grinding coal dust indicated that danger may arise in such plants. The preliminary drying of the coal is usually carried out in a rotary drying chamber from which the dried material passes to a grinding mill; the fine dust produced by the mill is blown by a fan to an overhead cyclone and the relief air returns this to the mill. Some of these drying plants are arranged so that the drying of the coal is carried out by means of flue gas, and the whole system is kept filled with flue gas so that an explosion is almost impossible. Where there is not such an arrangement, it is necessary that the plant should be well provided with safety relief vents, and that full precautions should be taken against risk of ignition. The matter is being discussed with the makers of such plant with a view to the issue of some simple code of safety rules.

Crushing and Grinding Machinery

Some Factors that Influence a Choice of Mills

With the development of industrial chemical processes there has been an increased demand for materials in a fine state of subdivision, in consequence of which crushing and grinding machinery has become important auxiliary units at many chemical works.

THE ultimate degree of fineness demanded in the preparation of chemicals for industrial use, or in the treatment of ores and other raw material intended to undergo extraction processes, varies considerably. Whether this is to be effected by pressure or by impact depends chiefly on the nature of the material and the shape and size of the particles desired, but the point where crushing finishes and grinding commences is more or less determined by economic considerations. In reducing large-size lumps, crushers of the gyrating or jaw type are almost universally employed for materials which are hard and abrasive in nature, whilst for softer materials single roll crushers are preferable.

Gyratory and Jaw Crushers

In the gyratory crusher the material is crushed by the pressure of a head or mantle which is mounted upon a vertical shaft and is given a gyratory movement in partial contact with liners secured to the upper part of the machine. The material feed into such a mill descends by gravity, and the size of the finished product is regulated by the clearance between the lower part of the mantle and the ring of liners. The central shaft is pivoted at its upper end, and the eccentric motion increases as the particles descend, the position of maximum pressure being continuously changed, giving a low power consumption per ton of material crushed. The gyratory movement is applied to this shaft at its lower end, turning the shaft into a lever, exerting a pressure which increases as it approaches the pivot point. Modern machines of this type are often constructed so that the revolving parts and the mechanism operating them are working continuously in a bath of oil, circulated by means of a pressure pump, and when necessary, cooled before re-entering the machine.

In the reciprocating or jaw crusher, reduction of the material is effected by forcing a jaw hinged at one end against another jaw which is fixed to the frame of the machine, the necessary force being furnished through toggle plates placed almost horizontally, in order to take the great pressure required to effect the crushing. Here, the material descends as the swinging jaw recedes, so that the crushing action takes place upon one-half of the stroke of the machine, a heavy fly-wheel being provided to equalise the load. The shape and construction of such a jaw crusher permits larger pieces of material to be fed to the machine than is the case with a gyratory crusher. The size of the finished product is regulated by adjusting the lower end of the swing jaw, whilst capacity is regulated by the discharge opening and the speed of the machine.

Mills for Reducing Medium-Size Lumps

For the reduction of medium-sized lumps, 3 in. and under, there is a greater choice of machines available—gyratory crushers of the short head type, granulators, cone crushers, horizontal and vertical disc crushers, rolls, stamp mills, ball mills, tube mills and hammer mills. The cone crusher is a machine which has been developed for the production of fine particles ranging from $\frac{1}{8}$ in. to $\frac{1}{4}$ in., chiefly where larger capacities are demanded beyond the range of gyratory crushers.

The various rolls available are numerous, ranging from the geared roll with a peripheral speed of 300 to 400 feet per minute, to the direct-driven type with a speed of 1,000 feet or more. The crushing faces or shells vary with the type of work to be undertaken, and may be plain, grooved, corrugated, indented or provided with teeth or spikes as occasion demands. They can be employed for crushing either wet or dry material, hard or soft in nature. The diameter of the roll is governed by the maximum size of the lumps to be crushed, and the width of face is made to suit the intended capacity. The ratio is generally from 3 (or 4) to 1, and the output is decided by the space between the roll faces and speed. Various devices are employed to relieve emergency stresses due to foreign matter, such as iron or wood, which may become accidentally mixed with the material under treatment. Plain face rolls are usually run at the same speed, but in the case of grooved or indented rolls, and in some cases with toothed rolls, the speed of one roll is different from its fellow, in order to prevent the spaces becoming clogged.

Ball mills can be employed advantageously for reducing material from 2 in. and under to 10 mesh. In comparison with stamp mills the h.p. consumption per ton of material crushed is lower, but the consumption of metal employed as the crushing medium is higher, being 2·5 to 3 lb. per ton in the case of the ball mill, as compared with 1 lb. per ton for the stamp mill. In some cases, as with the Hardinge conical mill, automatic classifying action takes place, the heavier and larger particles gravitating to the larger diameter of the mill shell whilst allowing the smaller and lighter particles to discharge. Plain ball mills are discharged through a grid fixed to the charging hole, either intermittently after crushing is completed, or continuously whilst the mill is in operation; in the case of a tube mill, continuous discharge is effected by a grid at one end or through a hollow trunnion.

Disintegrators

In disintegrators, the reduction of the material is also performed by percussion. Here the body of the machine is of cast-iron, the inside of the circular crushing chamber being lined with renewable chilled iron plates to reduce wear to the minimum. A strong spindle carried in self-lubricated bearings passes through the crushing chamber and carries a steel disc which, in turn, carries a series of beaters, the tips of which run close to the inner circumference of the crushing chamber. It is, therefore, to be seen that these beaters are mainly responsible for the crushing effected, being assisted by the ratcheted sides and the top of the chamber. The bottom half of the circumference of the crushing chamber is provided with a screen, which only permits passage of the material when reduced to the desired particle size.

The crushing of mineral material in the dry state is somewhat more difficult than when grinding wet, one of the difficulties being the separation of the fine particles from the coarse particles in the partly crushed porduct. Up to a point this separation can be effected by screening after the crushing operation, but when abrasive materials are in question it is not usual to carry the screening process beyond 50 mesh. Below 100 mesh separation is generally accomplished in a current of air operating at different velocities to suit the specific gravity of the material and the relative size of fine and coarse particles.

Hourly Tonnage and Power Consumption

In determining the size of suitable machines for crushing, the chief factors to be taken into consideration are the maximum dimensions of the largest lumps to be handled, and the hourly tonnage desired. In many cases the hourly tonnage is a great deal less than the output of the machine in question, its size being governed entirely by the maximum feed, and under these conditions economy has to be sacrificed. The hardness, toughness and abrasiveness of the material to be handled, its moisture content, and the shape and size of the particles in the finished product are secondary factors which influence the ultimate choice, other factors being fineness and evenness of product, minimum expenditure of power, low cost of upkeep, small floor space, minimum need of attention and adaptability. For any given material, the output and power consumption of crushing machinery is best determined from the results of an actual test.

Bibliographical Notes

The following papers on crushing and grinding have appeared in the technical literature during the last two years :—

Factors in modern methods of pulverizing. H. Hardinge. *Ceramic Industry* (1928), **11**, 166–9. Comments on the advantages and disadvantages of various types of mills, with operating data.

The grinding of materials. A. H. M. Andreasen. *Kolloid-chem. Beihefte* (1928), **27**, 349–458. Relates to experimental researches on particle size distribution incident to the disintegration process.

Pulverizing hard materials. H. von Wastenberg. *Chem. Fabrik* (1928), 617–9. Comparative tests as to size of particles used and quantities and size of particles produced, together with data on degrees of contamination from materials employed in construction of mills.

The theory of fine grinding. G. Martin and E. A. Bowes. *Trans. Ceramic Soc.* (1928), **27**, 247–89.

Crushing and pulverization. L. T. Work. *Ind. Eng. Chem.* (1929), **21**, 498–502. Present trends are outlined and illustrations shown from some of the more important fields.

Efficiency of grinding mills. J. Cross and S. R. Zimmerley. *U.S. Bureau of Mines, Repts. of Investigations No.* 2952 (1929).

A laboratory investigation of ball milling. A. M. Gow, A. B. Campbell and W. H. Coyhill. *Am. Inst. Mining Met. Eng., Tech. Pub.* No. 326 (1930).

The grinding capacity of flint ball mills. A. H. M. Andreason and J. J. V. Lundberg. *Trans. Ceramic Soc.* (1930), **29**, 239–50. A study of the fineness and surface produced in various types of mills.

Grinding and classification. A. W. Fahrenwald. *U.S. Bureau of Mines, Rept. of Investigations No.* 2989 *and* 2990 (1930). Relates to batch grinding and batch closed circuit grinding.

The mixing, grinding and refining of paints and enamels. S. Smith. *J. Oil and Colour Chem. Assoc.* (1930), **13**, 163–73. Comparison of edge runner mills and flat stone mills.

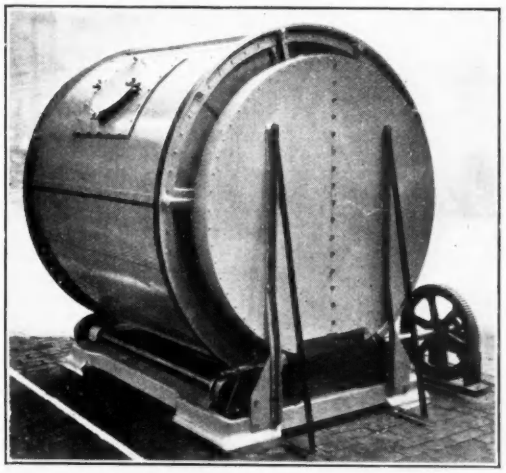
Blending and Mixing Moulding Powders

A New Machine with Novel Features

THE early growth of the moulding industry was attended by many failures from the point of view of finish, strength and reliability, but research and better machinery have contributed their quota, with the result that moulded articles are now of universal use. It has, for instance, been proved that the accurate mixing of moulding powders prior to the moulding operations is of supreme importance if the subsequent article is to be free from air holes and flaws of a similar nature. In order to obtain the ideal results, mixing should be performed mechanically, and it was with this point of view in mind that a new blending machine has been developed by W. and T. Avery, Ltd., of Soho Works, Birmingham, for the purpose of blending dry, free running powders.

Scientific Design of Internal Mechanism

In construction this blender is comparatively simple, comprising a drum-like structure supported on four specially designed rollers. The drum itself revolves through the medium of a worm-wheel and worm-drive and by this the bulking and discharge is obtained. For the internal mechanism, three types of mixing vanes are employed, known as the "baffle," "wing" and "cup" plates. The baffle plates, one top and one bottom, run across the drum. The wing plates



THE AVERY MIXING AND BLENDING MACHINE.

extend spirally from end to end of the drum and are fixed to the drum shell. The cup plates are fitted at the front end of the wing plates, and are for discharge purposes. The wing vanes turn the material over in one direction and the baffle plates have a reverse turning effect. As a result, the material undergoes a double turnover process and is thus thoroughly mixed, or bulked to a predetermined specific gravity, which is actually the most important function of the plant.

Facilities for Cleaning

As dyes of many different colours are used to meet particular requirements, it is essential that the blender should be easily cleaned when a change in colour is made. To enable this to be done extra doors are fitted, one in the drum side opposite the filling door and the other at the back end of the drum. Owing to the extremely fine penetrating nature of the substance, precautions have also to be taken to prevent leakage during processing. Difficulties of this nature are overcome by means of caulking all joints with strip aluminium and by the provision of a totally enclosed dust-proof discharge chute. In certain of the installations already supplied, discharge takes place on to an enclosed drag-link conveyor, whilst filling is from above through a cone shaped chute which fits tightly into the filling cavity on the blender, both operations being entirely proof against the dust machine. It is claimed that a 1 ton blend can be carried out in approximately 20 minutes and can be discharged to the last ounce.

Developments in Colloid Mills

Absence of Entrained Air in Emulsified Products

HURRELL AND CO., LTD., of Charlton, the manufacturers of the Hurrell homogeniser, or colloid mill bearing that name, have this week commenced foundations of new and extensive machine and assembly shops to enable them to better deal with the developments of their present type of machines, and also for new developments which they have in hand. Amongst the latter will be an improved type of mill, primarily intended for emulsifying. This will have two advantages which have been so far absent in this type of machine. There will be an entire absence of entrained air and the finished product will leave the machine under a very considerable head or pressure enabling it to be lifted to high level storage tanks, the upper storeys of factories, etc. Development work on this mill is now practically completed and it is expected that it will be on the market in various sizes before the end of the year.

In addition to the machinery required for the various branches of the chemical trade, the works at Charlton is busily engaged on complete bitumen emulsification plants which are sent to all parts of the world; these plants being

for an International company with which Hurrell and Co. are associated. Another manufacture which is approaching the commercial stage is a CO_2 indicator and recorder of exceptionally sound construction. This appliance is of the type

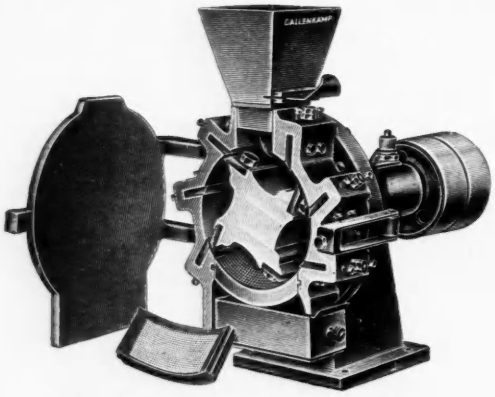
HURRELL HOMOGENISER: STANDARD MODEL.

which makes actual analyses of the flue gases, but except for the clockwork mechanism of the recorder there are no moving parts. While, no doubt, great strides have been made in the last twenty years towards fuel economy, there are still in existence many hundreds of steam raising installations where much seems to be annually lost through imperfect combustion of fuel. Improvements in appliances for insuring more economical steam raising are therefore to be welcomed.

Small-Scale Crushing Plant

Apparatus for Laboratory and Semi-Manufacturing Use

A WIDE range of crushing and grinding apparatus suitable for use in the laboratory or on a semi-manufacturing scale is supplied by A. Gallenkamp and Co., Ltd., of Sun Street, Finsbury Square, London, E.C.2. The accompanying illustration shows a laboratory mill which has been designed especially for the preparation of commercial products, for chemical analysis, such as drugs, fertilisers and foodstuffs, without loss of moisture from heating. In this mill, four knives on a revolving shaft work with shearing action against



THE GALLENKAMP LABORATORY MILL.

six which are set in a frame. The screen is dovetailed into this frame so that none of the material comes out of the grinding chamber until it is fine enough to pass through the mesh. Three sieves with screens of ½ mm., 1 mm., and 2 mm. mesh are furnished. The floor space occupied is 14 by 20 inches. Operating at 400 to 800 r.p.m., the power consumption is ½ to 1 h.p.

Gallenkamp and Co. also supply a small efficient disintegrator for dealing with quantities from a few ounces to one cwt., and which can be easily cleaned when changing from one material to another. In this disintegrator almost any dry material can be reduced to a fine powder, varying according to its nature from about one millimetre down to the finest flour. The front of the machine is removed in a few seconds, completely exposing the working part, thus allowing them to be brushed, wiped or sponged, when special cleanliness is necessary. The perforated steel sieves which regulate the fineness are interchangeable, and are fixed in a few seconds by thumb nuts on the underside of the machine, and the finished flour passes out through these to the receptacle below, which can take the form of a drawer or box; alternatively, a fixing can be placed under the mill to which a small bag of linen or suitable cloth can be clasped so that the ground material is delivered direct from the mill into the bag. The power required is from one to two horse power, an electric motor being the simplest source of power. The normal operating speed is 7,500 r.p.m.

An Efficient Grinding and Crushing Service

THE crushing and grinding of chemicals and products of similar nature constitutes an important section of the business conducted by Thomas Hill-Jones, Ltd., at Invicta Works, Bow Common Lane, London, E.3. This firm was established in 1830, and it has always been their policy to keep their works equipped with the latest and most efficient type of grinding machinery. They were, indeed, the first firm to substitute modern steel mills for the old-type stone mills Their present equipment is sufficiently wide and varied for them to handle all classes of material, either in quantities of thousands of tons for meeting the requirements of large contracts or small parcels intended for experimental use. Three acres of wharf are available at Bow Bridge for the landing and storage of material; they have also a large fleet of lorries and river craft available for transport purposes. Chemical manufactures carried on at the works include charcoal, manganese, decolorising carbon and bitumen for road-making,

Oil from Coal Controversy

REFERRING to the points raised by Sir Richard Redmayne in his recent letter to *The Times* (THE CHEMICAL AGE, August 22, page 160), Professor F. G. Donnan in a further letter to *The Times* states that in Germany the 100,000 tons per annum of motor spirit are actually produced by hydrogenation in the Leuna plant, and this production is (for economic and not technical reasons) at present mainly from low-temperature brown coal tar as a raw material. Regarding the relative yields of low-temperature tar, it is somewhat difficult to generalise. Suitable bituminous coal usually gives 8 per cent., and German brown coal, calculated on a dry basis, 18 to 32 per cent. It is, therefore, possible that the difference between the estimate given by Sir Richard Redmayne and Professor Donnan is due to the former being based on raw brown coal which normally contains 40 to 50 per cent. moisture.

Sheep Dips in Australia

ANIMAL dips imported into Australia during the year 1929-30 were valued at $6,004, compared with $48,041 for 1928-29. During 1929-30 the imports of arsenical washes and dips were valued at $5,036, while the non-arsenicals were valued at $968. The United Kingdom was the largest source of supply, with small quantities from Germany and other countries. The Australian exports of dips and insecticides were $107,067 for 1928-29 and $85,859 for 1929-30. The countries to which these dips were exported were principally New Zealand, Netherland East Indies, India, and New Guinea.

Proposed New Chemical Works in China

A GROUP of leading Chinese business men plan the construction, subject to approval of the National Government, of a large chemical works for manufacturing nitric and sulphuric acid. It is stated that in Shanghai alone there is an annual demand for approximately 50,000 drums of these acids. Preparations of plans for the plant will be under the supervision of Mr. Lin Ta-chung, director of the government powder factory of the Arsenal at Lunghwa Kiangsu.

Wood Impregnation with Water-Soluble Salts

By Dr.-Ing. E. H. Wolman and Dr. Pflug, of Berlin

This article refers to recent progress which has been made in the preservation of wood by impregnation with water-soluble salts, where unleachability and non-corrosive action towards embedded ironwork are important considerations in conjunction with fungicidal action.

THE requirements of a wood preservative differ according to the purposes for which it is to be used. As a result of the need for water soluble solutions of sufficient fungicidal properties and which are also durable and non-corrosive, yet cheap enough for industrial purposes, there are at the present day several such preservatives, all satisfactory in temperate climates. In tropical climates, wood which has been impregnated with water-soluble salts is affected, in addition to the attacks of insects, by the excessively heavy rainfall. In such climates, the impregnated wood is subject to a much greater leaching-out of its preservative, owing to the heavy rainfall and the ground-damp, and its durability is consequently much less than it would be in a temperate climate.

Zinc Chloride and Fluoride

Analytical calculations of the leaching-out of the well-known impregnating salts zinc chloride and fluoride can easily be made. Pine wood which has been saturated with a 2 per cent. solution of either of these salts and has subsequently been air dried, must be subjected to leaching-out until the leaching waters contain hardly a trace of the impregnating salt. An analytical examination will then show that about 93·5 per cent. of the fluoride and about 93·4 per cent. of the zinc chloride have been washed out of the wood. The above figures show that even approved preservatives are liable to fail as soon as the leaching-out rises appreciably above normal. Recent efforts have consequently been concentrated on improving this weak point in salt impregnation methods.

Among German processes of impregnating wood with preservatives of a low leachability, the so-called Flurasil process of completely saturating the wood with a water solution of zinc silico-fluoride has recently attracted much attention. This preparation is supposed in some way to unite with the wood fibre and to resist leaching out by the action of water. Our tests have, however, proved that about 90 per cent. of the Flurasil had been washed out of the wood.

Saturation with Weak Solution of Zinc Acetate

Of the foreign processes, we have submitted the so-called Z.M.A. process of the American, Curtin, to very thorough tests. This process is based on the saturation of wood with a weak solution of zinc acetate. The acetate is supposed gradually to evaporate, thus leaving in the wood the water-insoluble zinc meta-arsenite (Z.M.A.). Curtin has here made use of the observations of Wehmer and Elfving, according to whom the wood-destroying fungi can themselves produce chemical changes in the wood, resulting in the formation of an organic acid. Curtin maintains (and we quite agree with him on this point) that this secretion of acids is strong enough to produce zinc meta-arsenite. The diffusion of acids in the wood caused by the attack of the wood-destroying fungi thus sets up a poison by which the fungi are automatically destroyed.

The principle of the process, *i.e.*, the production in the wood of a substance which is insoluble in water but soluble in the fungic acids, appears to be sound. The Z.M.A. process does not, however, succeed in putting this principle into practice. The preservative solution decomposes very easily and can seldom be heated above 30–40° C. without decomposition setting in. Probably as a result of the incomplete evaporation of the acids from the wood during the drying, the conversion of the zinc meta-arsenite was irregular and incomplete. Wood which had been impregnated according to the Curtin method showed considerable losses of zinc and arsenic even when submitted to a leaching-out which was by no means exhaustive. This can only be explained by the fact that the conversion into Z.M.A. had taken place only to a very small degree. The leaching out tests (as applied to the above-mentioned preservatives), when applied to Z.M.A., showed that after exhaustive leaching 78·2 per cent. of the preservative leached out. The wood which had thus been submitted to exhaustive leaching out was severely attacked by the fungi *Coniophora* and *Polyporus*. It is therefore evident that Curtin's Z.M.A. process is not the long-expected solution of the problem of how to protect wood which is subject to severe leaching-out from the attacks of wood-destroying agencies. Curtin has, however, taken a step towards the solution of this problem by establishing the suitability for the destruction of fungus of water-insoluble but acid-soluble materials.

Impregnating Salts containing Chromates

Following the observations made by Curtin, we have succeeded in producing a new impregnating salt containing chromates and known here as "Thanalith-U." According to our tests with this salt, it would appear to present a satisfactory solution to the above-mentioned problem, *i.e.*, to impregnate wood in a simple and technically correct manner with salts which have a low leachability and at the same time a powerful preservative action. The new impregnating salt "Thanalith-U," the exact analysis of which cannot yet be disclosed (owing to the taking out of patents), contains diniotrophenol, salts of fluorine and arsenic, and chromates. For purposes of impregnation, this mixture is just as simple to handle as, say, sodium fluoride. Its water solution remains unchanged at boiling point, *and it has no action on metals*. During the drying process the soluble salt within the impregnated wood is transformed into an insoluble composition, so that at the end of the process the materials used for impregnation are present in a chemically different form from their original one. After exhaustive leaching-out tests on wood which had been impregnated with a 2 per cent. solution of Thanalith-U and then air-dried, it was found that 36·6 per cent. had leached out. For cases where an exceptionally low leachability is essential, *e.g.*, for water works, the leachability can be reduced by variation of the salt ingredients to as little as 20 per cent. Mycological tests showed that wood which had been impregnated with a 2 per cent. or even a 1 per cent. solution was immune from the attack of the fungi *Coniophora cerebella* and *Polyporus vaporarium*. The fungicidal action of Thanalith-U on the above fungi was tested according to the so-called log method, as advised by the International Conference of Mycologists and Wood Preservation Experts, at Berlin, 1930. The fungicidal action of the salt on the fungus *Coniophora cerebella* was shown to be 0·30–0·36 kg/m³ pine wood, and on *Polyporus vaporarius* 0·22–0·29 kg/m³ fir wood.

The action upon iron of the water solution of Thanalith-U was tested at room temperature and at 80° C. and it was shown that Thanalith-U does not in any way corrode iron.

Improvement in Unleachability

It would perhaps appear desirable to improve the impregnation of wood with salts of a low leachability to such an extent that a 100 per cent. unleachability should be attained. It is, however, doubtful whether this would be of any practical use for the purposes of wood preservation. It would necessitate a considerable decomposition within the wood of the impregnating agency which had been introduced, irrespective of whether this transformation should take place by physical means (*e.g.*, absorption) or by chemical means (*e.g.*, precipitation). This is in itself almost an impossibility; but in addition to this, the impregnating agency thus transformed would have to be completely insoluble in water. These requirements could scarcely be fulfilled with inorganic salts, such as occur in these mixtures. Thus, after an exhaustive leaching out (30 days leaching out on an agitator with change of water twice a day) there must always be a certain loss of impregnating agency. The merit of an impregnation process is to be judged by whether the impregnation agency, applied in the concentration in which it is delivered by the manufacturer, can undergo severe leaching tests and still protect the wood from the attack of wood destroying agencies.

It would be misguided to judge the merits of such a process solely on the lowness of its leachability. Thanalith-U has therefore not been prepared with a view to extremely low leachability, although this could easily have been done.

Leading the Blind

A Reply to "Overseas Briton"

To the Editor of THE CHEMICAL AGE.

SIR,—Having just returned from my annual vacation, my attention is called to your journal of August 8 wherein is printed a contribution to the above discussion (that you recently opened and closed) by one styling himself an "Overseas Briton."

I do not propose answering every point your correspondent makes—most of them are the usual distortion of actual facts. Says "Overseas Briton," "Whatever the State has touched has withered as if blighted." If this were true it would be too bad. Experience in every other country where state or municipal control operates results appear to be quite the reverse. I suggest "Overseas Briton" makes some international inquiries in the matter. Fundamentally state and municipal control of industries and services cannot fail to establish its unquestioned advantages to the public against private enterprise.

It will be clear to all your readers that "Overseas Briton's" lengthy association with Australian Labour politics has contributed nothing towards giving him a politico-economic understanding of Australian or world economics, and it is obvious he hasn't the faintest notion of the cause, effects, or solution of Australia's present economic difficulties or their relation to the international economic blizzard now raging. However, on the general question of Australia's growth, expansion, and until recently the general prosperity of its six million inhabitants, more than favourably comparable with other countries such as U.S.A., Great Britain, France and Germany, I should have no difficulty in proving that state and municipal control in Australia, limiting the operations of private enterprise in exploiting the masses, has been the main factor in preventing the economic crisis of the world battering Australia as it has the rest of the world with growing intensity since 1920. Australia's major difficulties are on the other hand quite recent, the worst phases only in evidence since 1928–9. General per-head consuming capacity of the Australian people even to-day is much higher than any other national's. "Overseas Briton" apparently does not know what a wonderful time the masses are having in U.S.A. or Britain—where under private enterprise and its so-called efficiency millions of people are unemployed.

For "Overseas Briton" to assert that Australia's state-controlled railways are a serious contributory factor in the Commonwealth's economic crisis is just sheer nonsense. At bottom the cause of the economic crisis in Australia arises from the pivotal fact that the national income has fallen in the last two years nearly 30 per cent., or close upon £150 millions, caused mainly by the bottom falling out of the prices on the world market of Australia's staple exports, wool, wheat, and pastoral products.

In the matter of "Overseas Briton's" key argument, railways, no difficulty will be encountered in demonstrating that his statements are unreliable. In 1927 Mr. Bruce, the Tory Premier, stated in London: "Australia's railways as Government institutions have enabled development to precede and pave the way for settlement instead of the slow wasteful and often socially unfortunate method of allowing settlement to precede development. The railways have proved to be tremendously effective agencies for developing our latent national assets. Transport is Australia's greatest problem and the distances to be covered are so great that railway development would scarcely be possible under normal conditions of private enterprise." "Overseas Briton" will have some job in working off that opinion of an anti-socialist.

According to the *Australian Year Book* 1930, the gross deficit on state railways in 1929, after allowing for all charges including interest, amounted to £4½ million. Against this deficit must be balanced the services, economic or other, the railways give to Australian life and development. In operation the railways for the six months ending December, 1930, earned a 19 per cent. balance, earning per mile being 12s. 1d. against an expenditure per mile of 9s. 11d.

The suggestion that state control of I.C.I. will endanger the interests of I.C.I. workers will "tickle to death" those who know the labour displacement that has occurred throughout I.C.I. since its formation in 1927. What were hitherto virile chemical towns, Widnes, St. Helens, etc., are now laid waste. Those displaced by amalgamation, closing of so-called redundant plants, and the application of new labour saving methods, amount to many thousands of both mental and manual workers.

I suggest that "Overseas Briton's" belief in profit-sharing as a means of solving the economic crisis indicates clearly his "Poverty of Economic Philosophy." Anyway let him state some definite information in support of his charges against state-controlled industries and services, and if the Editor will permit, I shall be pleased to give them a careful consideration and reply through THE CHEMICAL AGE.—Yours, etc.,

The Chemical Workers' Union. ARTHUR J. GILLIAN.
August 24, 1931.

[Mr. Gillian seemed entitled to a reply to the recent comments of an Australian correspondent, but, fresh from the joys of an "annual vacation," at some jolly un-class-conscious holiday resort, we hope he will agree that this hard-worked subject is also entitled to a rest.—ED. C.A.]

Business and Combines

To the Editor of THE CHEMICAL AGE.

SIR,—I see in your issue of 22nd inst. a letter on "Thoughts on Business and Combines" and appreciate the candid way in which the writer has drawn attention to what every business man should study. The difficulties of to-day can only be overcome by management by men conversant with the details and with personal initiative. Mechanical systems to run a business at all times will fail as the contact between seller and purchaser is lost, and in consequence, satisfaction cannot be given. Mr. W. S. Lloyd-Willey is to be congratulated on his letter.—Yours, etc., O. L. GOWER.

Precautions in the Use of Digesters

Result of Official Inquiry concerning an Explosion

AN official report of the inquiry into the cause of the explosion of a digester at the works of John Riley and Son, Ltd., chemical manufacturers, Hapton, near Accrington, on December 17, 1930, has just been issued by H.M. Stationery Office (Boiler Explosions Act, 1882 and 1890: Report of Preliminary Inquiry No. 3121, price 6d. net).

This digester consisted of a cylindrical cast-iron pot having a hemispherical bottom and a flanged top, with a cast-iron dished cover secured by 40 1 in. bolts. The internal diameter of the pot was 7 ft., and its depth, 5 ft.; the original body thickness appears to have been 1⅛ in. The digester was purchased second-hand from the North British Chemical Co., Ltd., of Droylsden, in October, 1927, but the age of the vessel and the name of the makers could not be obtained. It was inspected and hammer-tested about the latter end of 1928 before installation.

Fractures Due to Expansion and Contraction Stresses

The vessel was used for the manufacture of a chemical solution and the contents were heated by a steam coil and by the admission, from time to time, of live steam via an internal liquor discharge pipe led to the bottom of the vessel, chemical action being assisted by a revolving agitator. A temperature corresponding to a steam pressure of 40 lb. per square inch was considered ample for the process, and instructions to the effect that this pressure was not to be exceeded during the process were given by the works manager, and appear to have been fully appreciated and acted upon. The vessel was, however, connected to a steam supply of 70 lb. per square inch, without a reducing valve being interposed, and although the evidence indicates that the safety valve was lifting some 10 days before the explosion, it is established that it had since become fixed in its seat and was inoperative when the explosion occurred.

Immediately prior to the explosion a gauge pressure of 36 lb. was recorded, but an examination of the remains of the vessel indicates that the explosion was caused by the pot portion of the digester having become weakened to an extent whereby it became unable to withstand the internal pressure to which it was subjected. There was some evidence that one of the fractures had occurred prior to the explosion, and it is possible that such fracture was the culmination of expansion and contraction stresses experienced over a considerable period. Contributory causes may have been vibratory stresses due to the introduction of live steam into a comparatively cool liquid and the generation of an internal pressure greater than normal due to the safety valve being inoperative.

Chemical Industries of Chile

Conditions in the Nitrate Field.

The report on "Economic Conditions in Chile 1930," prepared by Mr. E. Murray Harvey, Commercial Secretary to H.M. Embassy at Santiago de Chile (H.M. Stationery Office, pp. 102, 3s.) appears at a time when Chilean finance and industrial conditions are very much under discussion, and although the matter was prepared before the position became critical, it contains information of considerable help in understanding the present situation.

Among the natural resources of the republic nitrate naturally comes first, and the report describes the purpose and the constitution of the national organisation known as "Cosach." Comparing the year 1928–29 with 1929–30 there was a decrease in nitrate produced of 280,166 metric tons, in nitrate exported of 761,833 metric tons, and in nitrate consumed of 407,416 metric tons. Out of 151 ofinicas 67 were working in 1929 and 38 in 1930, while the number of workmen employed respectively in those years was 58,685 and 48,478.

Commenting on these figures the report of the British Chamber of Commerce in Chile states: It will be seen that owing to world crisis in raw materials of every nature the consumption of nitrate has suffered adversely, thereby affecting, too, both shipments and production. As a matter of fact production was restricted by means of a pact made between the producers which came into effect on February 1, 1930, whereby those plants which produced at a high cost were paid 6d. per metric quintal on the quantity estimated they ceased to produce per month. To finance the cost of the cessation of about 20 per cent. of the producers a fund was formed by those who continued working. It is a pity that the implantation of such a scheme was delayed so long, for had it been introduced a year earlier when originally mooted the statistical position would not have appeared so heavy. The centralised selling scheme through the medium of "transitaires" which was referred to in the last yearly report continued in operation without any alteration up to June 30, but about the beginning of the year a scheme was put forward by the American group of producers by means of which, as from July 1, 1930, all conveyance to and sales of nitrate in Europe and Egypt was to be centralised in the hands of the Association itself.

To carry this scheme into effect a Central Committee was formed in London of five members, one representing the Chilean Government, one the German producers, one the Sabioncello group and two the Americans. Practically all the old-established wholesale dealers in nitrate have thus been put out of business and the new committee claims that by centralised organisation it will be able to sell nitrate direct to consumers without it passing through so many hands. It remains to be seen whether in practice this proves correct. It will probably take a little time before the "Cosach" can commence operations, but the general opinion is that in principle the scheme is sound, for by consolidating all the interests the industry should derive a direct benefit.

Heavy Chemicals

In spite of the world crisis there was no appreciable decrease in the consumption of industrial chemicals until the last quarter of the year, when the falling off in retail sales began to influence industrial production. The bulk of the trade in the ammonia soda groups remainded in the hands of British manufacturers, the importation from the United States, which showed an important total in 1929, being considerably reduced. Potash chemicals were largely supplied by Germany.

The local factory manufacturing sodium sulphide, which is the only industrial chemical produced on any scale in Chile, made a certain amount of progress, but it was by no means able to eliminate importation in spite of the highly protective tariff, and the tanning industry felt the consequences in its costs.

Prices of ammonia soda chemicals had been depressed to rather below world levels in 1929, owing to over-importation, and were therefore on the up grade during 1930.

Drugs and Pharmaceutical Products

The imports of drugs, pharmaceutical products and perfumes increased from £380,000 in 1928 to about £443,000 in 1929. The United States, with 30 per cent., Germany 26 per cent., France 25 per cent., and Great Britain 8 per cent., were the principal countries of supply; others being, in the order named, Italy, Argentina, Belgium, Spain and Holland.

Among the largest items are "pastilles, tablets, pills, capsules, etc., with medicaments," £117,000; non-specified pharmaceutical products, £43,000; hypodermic injections in various forms, £38,000; pomades and medicated unguents, £20,000; perfumes, £17,000; vaccines, £16,000; dentrifrices, £14,000; carbolic and similar disinfectants, £12,700.

Intensive advertising is necessary to introduce proprietary toilet preparations; most of the well-known brands are represented on the market, and hold their own so far in face of the highly protective duties.

Paints, Varnishes, Inks and Colours

The imports under this heading amounted in value during 1929 to the equivalent of £340,000. Great Britain's share of this trade was 30 per cent., that of the United States 26 per cent., Germany 23 per cent., and Belgium 12 per cent.

Among the articles coming principally from the United Kingdom are paints of all kinds, Prussian blue, red lead, varnishes and writing inks. The United States exports enamels, varnishes, ready-mixed paints, printers' inks, marking and stamping inks, lamp black and shoemakers' inks and dyes to Chile. Germany's quota is made up principally of dry colours, aniline dyes, graphite pencils, zinc white, lithopone, etc., bronze powders, crayons and printers' ink. Belgium supplies nearly 50 per cent. of the aniline and similar dyes, and some lithopone, etc., and Holland sends white paint bases.

Among the articles coming under this heading that are affected by the increase in duties which came into force on February 7, are red oxide, ochres and earths, and writing inks, on which the increase is of about 20 per cent.; and Prussian blue, lamp black and animal charcoal, and liquid and paste paints prepared in water, oil or turpentine on which the duties are to be increased by about one-third.

Heavy Chemical Imports

The following table shows the imports of the principal heavy chemicals into Chile for 1927, 1928 and 1929:—

Chemicals.	Year.	Tons.	U.K. %	Other Importing Countries.
Sodium silicate	1929	441	72	Belgium, Holland and France
	1928	379	64	Germany, Belgium and Holland
	1927	383	40	United States 38%, Holland and Germany
Sodium hyposulphite	1929	1,824	63	United States 16%, Belgium 13%, Germany
	1928	866	34	United States 40%, Belgium and Germany
	1927	1,032	30	United States 40%, Germany and Belgium
Calcined sodium carbonate (soda ash)	1929	7,879	74	United States 24%
	1928	6,601	99	
	1927	4,252	90	
Caustic soda	1929	3,068	82	United States
	1928	1,905	90	
	1927	1,622	60	United States, Germany and Belgium
Sulphuric acid	1929	445	9	Germany 39%, Holland 32%, and United States 15%
	1928	368	20	Germany 35%, Holland 30%
	1927	669	20	United States 40%, Germany 35%
Sodium sulphide	1929	230	85	Belgium and Germany
	1928	664	85	Germany and Belgium
	1927	503	55	Germany 20%, Belgium and Holland
Bisulphite and sulphite of soda	1929	1,755	12	United States 43%, Holland 22%, Belgium 13%
Pure borate and carbonate of soda; purified nitrate of soda and pure caustic soda	1929	185	5	Germany 86%, United States 6%.
Sodium bicarbonate	1929	583	79	United States 14%, Germany
	1928	637	80	Germany and United States.
	1927	397	90	
Alkaloids (various)	1929	1·41	5	Germany 58%, France 23%, Holland 7%.
	1928	0·55	10	Germany 40%, Japan and France
	1927	1·14	5	Germany, 60%, France 25%
Potassium chlorate	1929	60	—	Sweden 50%, Germany 22%, Belgium 17%
	1928	20	—	Germany 75%, and United States
	1927	83	—	Sweden 65%, Germany 30%
Bichromate of potassium	1929	79	16	Germany 66%, Holland 14%
Calcium carbide	1929	9,517	5	Norway 53%, Italy 22%, Germany 14%
	1928	7,700	—	Germany 30%, Norway 30%, and United States
	1927	4,280	—	Norway 50%, Germany 30%

A Chemical Merchant's Financial Affairs

Private Arrangement of J. Schnurmann

A MEETING of creditors of J. Schnurmann, rubber and chemical merchants, Downham Mills, Chesnut Road, London, N.17, was held recently at the Institute of Chartered Accountants, Moorgate Place, E.C., when Mr. S. F. Ward, one of the creditors presided. A statement of affairs prepared by Wild, Ferguson-Davie and Miller, C.A., Fore Street, E.C., was submitted which disclosed liabilities of £40,941, of which £6,723 was due to the trade; there were cash creditors for £4,980, and bills payable amounted to £28,294. In addition there were forward contracts for rubber bought amounting to £3,265, and the value as at August 13 last was £2,321, leaving an amount to rank for dividend of £944. There were fully secured creditors amounting to £33,609, and they held rubber warrants deposited as security estimated at £34,544. The bank were also fully secured creditors for £5,537, holding security valued at £5,765. The assets consisted of cash in hand and at bank £47 14s. 8d.; cash in the hands of Leopold Josephs and Sons, and Comptoir National, £44 16s. 9d.; stock-in-trade, £13,593; book debts, £3,044; amount due from Rubber Industries, Ltd., £5,626; and from J. Sherman and Co., Ltd., £2,870; plant and machinery, £8,653; engineers stores, £443 11s. 2d.; motor car, £200; office furniture, £500; and surplus from fully secured creditors, £1,162; making total assets of £36,185, from which had to be deducted preferential claims £1,295; leaving net assets of £34,889, or a deficiency of £6,052.

Mr. Smith, of Oppenheimer, Nathan Vandyk and Co., solicitors, who represented the debtor, said that he was consulted only a few days ago with regard to the position. He was told that the banks held large quantities of rubber as security for margins, and they were pressing and asked for further margins of £1,000, which would have to be paid immediately.

Mr. Miller, the debtor's accountant, said that the business was established 35 years ago. The trade done was a very large one and consisted principally of dealing in waste rubber and crepe rubber and chemicals. In 1928 the sales were £273,359; and there was a gross profit of £28,141; the expenses were £31,000; and there was a loss of £3,000. In the following year the sales were £163,791; the gross profit was £30,397; the expenses were £28,000; and there was a profit of £1,500. During 1930 the turnover amounted to £176,866; the gross profit was £34,371, and there was a net profit of £4,858. In 1931 the turnover was £136,125; the gross profit was £22,655, and there was a loss of £3,392. In that year there was a fire and the debtor received £20,666 from the insurance company. Rubber Industries, Ltd., was formed with a paid up capital of £27, and J. Sherman and Co., Ltd., was formed with a paid up capital of £45. All the shares were held by nominees of Mr. Sherman. Rubber Industries, Ltd., dealt with the crepe rubber; chemicals were sold through J. Sherman and Co., Ltd.

Mr. Smith said that the debtor was desirous of carrying on the business if possible, and he offered the creditors a composition of 10s. in the £ spread over a period of 18 months, payable as to 1s. 3d. in three months, 1s. 9d. in six months, 1s. 9d. in nine months, 1s. 9d. in twelve months, 1s. 9d. in fifteen months, and 1s. 9d. in eighteen months, which would be secured by a deed of composition to be entered into by the debtor giving him leave to carry on the business under the supervision of a trustee and a committee of inspection. By that means the business would be entirely under the creditors control and in the event of any instalment being in arrear the creditors would be entitled to call upon the debtor to execute a deed of assignment.

The position was discussed at considerable length and it was eventually decided that the meeting should be adjourned, and in the meantime the position should be further investigated by Lionel H. Lemon and Co., together with a committee consisting of the representatives of Kaufman, Heyworth and Co., Ltd., General Rubber Co., Ltd., and Mr. S. F. Ward, and that the result should be made known at the adjourned meeting.

Hints for Commercial Visitors

THE latest additions to the series of "Hints for Commercial Visitors," issued by the Department of Overseas Trade, relate to British West Indies (Ref. C. 3583), Belgium (Ref. C. 3590), and Latvia (Ref. C. 3615). Copies may be obtained on application to the Department (35, Old Queen Street, S.W.1), quoting the appropriate reference number.

Chemical Industry Lawn Tennis Tournament

Semi-Final Results; Arrangements for Final

AFTER a series of excellent games with some very interesting results, the Chemical Industry Lawn Tennis Tournament, organised by THE CHEMICAL AGE, has now reached the final stage. In the semi-final round Messrs. S. B. Gane and D. E. Raine, of Johnson Matthey and Co., Ltd., Birmingham, beat Messrs. S. Perridge and W. L. Alldis, of Chemicals and Coke Ovens, Ltd., London, by 6—0, 6—1, and Messrs. S. Newman and E. J. Lawrence won their match with Messrs. H. Anning and T. Baxter, of British Industrials Solvents, Ltd., by 6—0, 6—2. The final contest, which promises to be a very close fight, will therefore be as follows:—

S. B. Gane and D. E. Raine

v.

S. Newman and E. J. Lawrence.

Arrangements have been made to play off the final match at the York Gate Hard Tennis Courts, Regent's Park, London, on Saturday, September 12, commencing at 2.30 p.m., when the Benn Brothers Annual Tennis Tournament is also being held. Any members of the firms who have competed for the tournament, as well as those in the industry who are interested, are invited to witness the final match. The courts are situated in York Gate, just off the Marylebone Road, within a few minutes walk of Baker Street Station.

The Change of Government

Mr. Arthur Reavell Gives a Lead

INQUIRIES among leading chemical and chemical engineering firms show that a large number of directors, etc., are still away on holiday, but among those available the change of Government is regarded as favourable, and when the situation is more developed opinions will be more freely expressed.

Meanwhile, Mr. J. Arthur Reavell, managing director of the Kestner Evaporator and Engineering Co., gives an excellent lead in the following statement:—

"The advent of a National Government has brought a feeling of relief and a spirit of hope to all of us who are striving to develop the nation's industries. The result of the constant drain of the nation's wealth, due to excessive taxation, from non-productive purposes, has been to leave technical businesses without resources which they normally spend in experimenting and development.

"Our nation depends on its industries for its very existence and unless there is an ultimate adequate reward for men who are striving to keep their section of industry in the forefront of scientific advancement, a spirit of hopelessness and paralysis is bound to creep in.

"This feeling has been growing more and more apparent, but with the advent of the new Government a great spirit of optimism has been created, and if the Government carry out the programme that they have put their hands to they will be backed to the utmost by all who have the nation's interest at heart.

"Let us hope that the doctrine that it is a crime to make a profit in business has disappeared, and that those who are prepared to think hard and work hard will be considered benefactors of the nation and not its enemies."

Developments in Treatment of Lubricating Oil

A NEW process is to be used in the manufacture of high-grade motor lubricating oil at the new factory erected by Imperial Oil, Ltd., at Sarnia, Ontario, which it is claimed embodies the almost complete removal of carbon and gum-forming constituents which have no value as lubricants. This process has been developed by Dr. R. K. Stratford, chief of the company's research department, the experimental work extending over a period of five years.

New Dyestuffs Combine

THE Societa Aziendi Colori Nazionali Affini Acna has been founded with a capital of 60,000,000 lire, of which the Montecatini concern is to subscribe 31,000,000 and the I.G. Farbenindustrie 29,000,000. The new firm is taking over from the Acna, now in liquidation, the dye works at Rho, Casena, Maderno, and Clugio, and, in addition, the I.G. works at Bianchi.

From Week to Week

SIR MAX MUSPRATT has been appointed joint trustee to the debenture stockholders of British Insulated Cables, Ltd.

FRIENDS of the late Professor J. W. Hinchley are invited to attend a Memorial Service at the Ethical Church, Bayswater, London, W.2, on Saturday, October 3, at 12 noon.

THE THIRD ANNUAL CONFERENCE of the National Smoke Abatement Society will be held at Liverpool, September 18-20. Further particulars can be obtained from the Society's Central Offices, 23, King Street, Manchester.

MR. A. E. MUSGRAVE, chief chemist at the Spittlegate Ironworks of Ruston and Hornsby, Ltd., at Grantham, has been admitted into the Grantham Hospital suffering from injuries sustained when a pan of castings fell on him and pinned him down.

MR. DAVID HAMILTON, B.Sc., A.M.I.C.E., has been appointed representative of Birmabright, Ltd., and Birmal Chemical Engineers, for the London area. His address will be: Abford House, Wilton Road, Westminster, S.W.1., and his telephone number: Victoria 0932.

AN ORDER for the compulsory winding-up of Ridge Hill Barytes Mines, Ltd., of Liverpool, was made by the Deputy of the Chancellor of the Chancery of Lancashire, on Tuesday, August 25, upon the application of Mr. Geddes (instructed by Layton and Co.), representing the petitioner, Mr. William Roberts MacGregor, liquidator of George G. Blackwell, Sons, and Co., Ltd., creditors for £2,525, money lent.

THE BOARD OF POTGIETERSRUST PLATINUMS, LTD., has issued to the shareholders a circular pointing out that the negotiations between the chief producers of the world to form a company for stimulating the uses and regulating the marketing of the metal are now nearing completion. As the quota which can be allotted to South Africa is insufficient to permit of the working of two mines as independent units, it is proposed to amalgamate the Eerstegeluk and Waterval mines under a new company, the whole of the issued capital being allocated to the Potgietersrust and Waterval companies on the basis of a valuation of the assets transferred.

THE LANCASHIRE AHD CHESHIRE COAL ASSOCIATION is transferring its research activities from the Manchester College of Technology to the Association's own new premises at Cheetham. Since the Association began its research work in 1918, the field of activity has been substantially extended and now covers not only matters of safety and efficiency in working, but problems connected with the scientific utilisation of coal, and with analysis, sampling and preparation of coal for better service to the consumer. The new premises will be formally opened on September 22 by Mr. R. A. Burrows, and the ceremony will coincide with the annual conference in Manchester of the Institute of Mining Engineers.

ACCORDING to the returns given in the *Ministry of Labour Gazette* for August, 15,620 persons were registered as wholly unemployed on July 27 in respect of the chemical industry in Great Britain and Northern Ireland; an additional 2,268 persons were affected by temporary stoppages. These figures do not include persons engaged in the manufacture of explosives (2,240 wholly unemployed, 572 temporary stoppages); paint, varnish, red and white leads (1,841 wholly unemployed, 204 temporary stoppages); and oil, glue, soap, ink and matches (7,844 wholly unemployed, 1,867 temporary stoppages). In comparison with figures for June 22, persons wholly unemployed in the chemical industry have declined to the extent of 5·3 per cent.; temporary stoppages have increased 7·2 per cent.

THE AUTUMN MEETING OF THE CERAMIC SOCIETY (Building Materials Section) will be held at Leicester, September 8–9. Visitors will have the opportunity of inspecting the works of the Hathern Station Brick and Terra Cotta Co., where the manufacture of chemical stoneware is carried on. Among the papers to be presented at the meeting at University College, Leicester, is one on "Research and Some Modern Tendencies in the Structural Clayware Industry," by C. H. J. V. Phillips. The annual meeting of the Refractory Materials Section will be held in London, November 18–20. Here the programme will include a visit to the works of the Moler Products Co., at Colchester, who are well-known as makers of heat insulation products which have been used to a considerable extent in chemical plant buildings.

BELGIAN METAL WORKERS have accepted a reduction of 2½ per cent. in wages as from September 1.

AMILCARE MARESCALCHI, manager of the Stacchini powder factory (Italy), was hurled through the windows of a hut on to the railway line and killed, on the occasion of a recent explosion.

THE BRITISH CARBO-UNION, LTD., formerly of Bush House, Aldwych, London, W.C.2, are removing their registered offices to 52, Grosvenor Gardens, London, S.W.1. Their new telephone number will be Sloane 9134; telegraphic address: Bricarbun, Sowest, London.

WHILST FOLLOWING HIS EMPLOYMENT at the South Yorkshire Chemical Works, Parkgate, on Sunday, August 23, Charles Lawtry (45), of South Street, Greasbro', received serious injuries as a result of a mixer bursting whilst handling sulphate of ammonia.

ACCORDING TO A REPORT FROM CHILE the Chamber of Deputies which is enquiring into the action of the ex-Prime Minister Senor Ruiz in connection with the Cosach law (under which the seventy-five million sterling combine, Compania de Salitre de Chile, was formed) has voted for the taking of formal proceedings charging him with having acted illegally in changing the law and creating "Cosach."

HEAVY FINES have been imposed on the managing director and another director of a chemical works in the Liége district on account of poisonous gases which are stated to have come from the works. This is a sequel to the deaths of 75 persons and many cattle in the Meuse valley, between Liége and Huyann, in December last, poisonous gases being believed to have been the cause of these fatalities. It is understood that the present fines are quite independent of any civil actions that may be brought by persons who have suffered loss or bereavement as a result of the gases.

MR. R. H. K. PETO, who with two other Englishmen, Mr. R. Kershaw and Dr. W. E. Downey, was killed on Wednesday, August 19, while climbing the Jungfrau, Switzerland, was an analytical chemist for the Cotton Growing Corporation in Sudan. He took his B.Sc. degree at London University, and was appointed in 1927 assistant chemist at the Wellcome Tropical Research Laboratories. Dr. Downey was a research chemist at the General Electric Co.'s Research Laboratory at Wembley, where he had been for four or five years, and was a valued member of the staff. He was a Beit scholar of the Imperial College of Science, South Kensington.

Obituary

MR. PHILLIP SAUNDERS, who was the first man to discover gold in Western Australia, has died at Kalgoorlie, aged 93 years.

DR. DROOP RICHMOND, F.I.C., chief analyst to Boots Pure Drug Co., Nottingham, for sixteen years, on Wednesday, aged 64.

MR. A. G. HOLROYD, who claimed to be the discoverer of telluride gold ore on the Kalgoorlie field, died in Melbourne on June 21.

THE death has taken place of Mr. JOHN D. WADDELL, who has been contractor to J. and J. White, of Shawfield Chemical Works, Rutherglen, since 1908.

MR. JAMES EMERY TULLY, head of the firm of John Ridley, Son and Tully, and a director of the Bede Metal and Chemical Co., died on Thursday, August 21, aged 80.

THE death took place at Boyth, Nottinghamshire, on Sunday last, August 23, of Mr. J. C. B. FIRTH, a director of Thos. Firth and John Brown, Ltd., aged 38. He was a direct descendant of one of the founders of Thomas Firth and Sons.

MR. ALEXANDER KENNEDY, whose death was reported from a nursing home in London last week, was founder of the Castlebank Dyeworks, Anniesland, Glasgow. He was one of the most prominent figures in commercial circles in Glasgow, and came to Glasgow early in life, founding the Castlebank Dyeworks 53 years ago.

MR. GEORGE MACKENZIE, secretary and treasurer of the Canadian Institute of Mining and Metallurgy and one of the best known members of the Canadian mining fraternity in Canada, died at Montreal on August 24, after a sudden illness. Mr. Mackenzie, who was 54, acted as secretary at the meeting in Canada a few years ago of the Empire Mining and Metallurgical Congress.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

348,363. Treatment of Aluminium Phosphates. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges, Frankfort-on-Main, Germany. Application date, May 1, 1930.

Materials containing aluminium phosphates are dissolved in hydrochloric acid, *e.g.*, at 60-100° C—to produce a solution containing about 100-150 grams of aluminium chloride per litre. By passing gaseous hydrogen chloride into this solution, preferably after evaporation and cooling, the aluminium chloride is precipitated as the hexahydrate. Alumina may be obtained by calcining the chloride, and phosphoric acid is recovered from the mother liquor after treatment with air at 80-90° C. to expel the hydrogen chloride.

348,382. Aminoaldehydes and Aminoalcohols. C. Mannich, 14a, Flemmingstrasse, Steglitz, Berlin. Application date, May 14, 1930.

An aldehyde of the general formula $\begin{matrix} R \\ R^1 \end{matrix}\!\!>\!CH\cdot CHO$, or a substance yielding such an aldehyde, is condensed with a primary or secondary amine of the general formula $HN\!\!<\!\!\begin{matrix} R^{II} \\ R^{III} \end{matrix}$ and with formaldehyde to produce aminoaldehydes of the general formula

$$\begin{matrix} R \\ R^1 \end{matrix}\!\!>\!C\!<\!\!\begin{matrix} CHO \\ CH_2\cdot NR^{II}\cdot R^{III} \end{matrix},$$

in which R is alkyl, R^1 is alkyl or hydrogen, or R and R^1 together with the adjacent carbon atom form a hydroaromatic ring, R^{II} is alkyl, R^{III} is alkyl or hydrogen, or R^{II} and R^{III} together with the adjacent nitrogen atom form a heterocyclic ring. The products are reducible to the corresponding alcohols and are intermediates for the manufacture of drugs. Examples relate to the preparation of (1) and (2), α : α-dimethyl-β-dimethyl(or diethyl)aminopropionaldehyde from isobutyraldehyde, dimethyl(or diethyl)amine hydrochloride, and paraformaldehyde, (3) α : α-dimethyl-β-piperidinopropionaldehyde from isobutyraldehyde, piperidine, and paraformaldehyde, (4), α-isopropyl-β-dimethylaminopropionaldehyde from isovaleraldehyde, dimethylamine hydrochloride, and formaldehyde, (5), 1-(piperidinomethyl)hexahydrobenzaldehyde from hexahydrobenzaldehyde bisulphite compound, piperidine hydrochloride, and formaldehyde, (6), α-(methylaminomethyl)isobutyraldehyde from isobutyraldehyde, methylamino hydrochloride, and paraformaldehyde, (7) and (8), the product of (1) from para-isobutyraldehyde (or isobutyraldehydeacetal), dimethylamine hydrochloride, and formaldehyde, (9), the product of (2) from isobutyraldehydeacetal, diethylamine hydrochloride, and formaldehyde, (10), 1-(diethylaminomethyl)hexahydrobenzaldehyde from hexahydrobenzaldehydeacetal, diethylamine hydrochloride, and formaldehyde.

348,482. Bicarbonates. A. Mentzel, 2, Nordsternstrasse, Schöneburg, Berlin. International Convention date, August 23, 1929.

In the manufacture of ammonium and sodium bicarbonates in the known ammonia-soda process by precipitation with carbon-dioxide of an aqueous solution of ammonia or ammonia and salt, the carbon dioxide is derived from the gas evolved in the low temperature carbonisation of the coal or lignite used as fuel to supply the energy requirements of the process. The calorific value of the effluent gases is substantially increased.

347,955. Vulcanisation Accelerators. Naugatuck Chemical Co., Elm Street, Naugatuck, Connecticut, U.S.A., Assignees of S. M. Cadwell, Leonia, New Jersey, U.S.A. International Convention date, July 2, 1929.

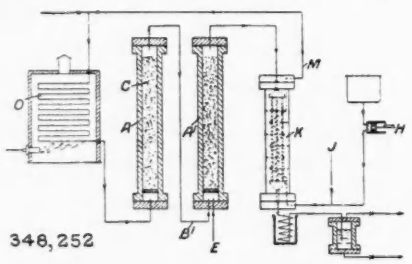
Polyethylene polyamines applicable as accelerators of rubber vulcanisation are obtained by reaction under pressure of alkylene dihalides, such as ethylene dichloride and propylene dichloride with ammonia. Both polymerisation and condensation are stated to occur in the reaction.

348,063. Synthetic Resins. P. Hofer, 7, Delsbergerallee and A. Schmid, 5, Pelikanweg, Basle, Switzerland. International Convention date, February 4, 1929.

Artificial resins such as urea-formaldehyde condensation products used in the production of light-proof coloured glazes upon cement and like slabs and tiles are free from halogen and from phenols or condensation products thereof. A urea-thiourea-formaldehyde condensation product containing an addition of ammonium nitrate as hardening agent is stated to provide an exceptionally waterproof glaze.

348,252. Destructive Hydrogenation. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 26, 1930.

The supply of heat for a destructive hydrogenation operation after the treatment has been started is effected by adding to



348,252

the reagents, at one or more points of the system, oxygen-containing carbon compounds, *e.g.*, oxides of carbon or phenols, which under the working conditions are reduced to hydrocarbons with liberation of heat. In an example petroleum of boiling point 200°–350° C. is forced by a pump H through a heat-exchanger K, hydrogen is supplied by a pipe J, and the mixture leaving the heat exchanger at M is further heated in a coil O to 460° C. and passed as vapour into a reaction vessel A containing a zinc-molybdenum catalyst C. It is then passed at B^1 into a second reaction vessel A^1, to which carbon dioxide is supplied at E. 96 per cent. of the carbon dioxide is reduced to methane, and fall of temperature is thus prevented. A brown coal-tar fraction containing 28 per cent. of phenols may replace the carbon dioxide.

348,420. Synthetic Resins. Imperial Chemical Industries, Ltd., Millbank, London. International Convention date, June 4, 1929.

Ammonium thiocyanate is heated with formaldehyde in an acid, neutral, or alkaline medium, and water is removed from the reaction product by evaporation. The resultant resin may be hardened to any desired degree by heat. The specification as published under Section 91 (3) (a) of the Acts includes also the replacement of the formaldehyde by a substance supplying formaldehyde, *e.g.*, hexamethylenetetramine.

348,479-80. Organo-Arsenic Compounds. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention dates, August 24 and August 27, 1929.

348,479. Water-soluble methanesulphonates of aminoarylarseno compounds possessing therapeutic value are obtained by treating compounds of the type

$$HO\cdot CH_2\cdot CO\cdot NH\cdot C_6X_4\cdot As : As\cdot C_6H_2(OH)(NH_2)$$

in which X is hydrogen or a substituent, with formaldehydebisulphite. The starting materials are obtainable by known methods of transformation of a mixture of glycollylaminoarylarsinic acid and an aminophenolarsinic acid. Examples relate to the treatment with sodium formaldehydebisulphite of sodium 4-glycollylamino-3^1-amino-4^1-hydroxyarsenobenzene and sodium-3-amino-4-hydroxy-2^1-methyl-4^1-glycollylaminoarsenobenzene, followed in each case by neutralisation with acid. The specification as published under Section 91 (3) (a) of the Acts includes the similar treatment of the corresponding arsenobenzenes obtainable by the replacement of the aminophenolarsinic acid by any arylarsinic acid substituted

in the aryl nucleus by an amino group or by a residue containing an amino group.

348,480. Hydroxyacylaminophenylarsines are obtained by reduction of the corresponding arsenic acid with zinc dust in presence of mineral acid, hydroxyacylaminodichlorarsines by treating the corresponding arsenoxide with concentrated hydrochloric acid, and hydroxyacylaminoarsenobenzenes by condensing an arsine with an arsenoxide or dichlorarsine, one or both components containing a hydroxyacylamino group.

348,593. Synthetic Resins. Deutsche Gasgluhlicht-Auer-Ges. 16, Rotherstrasse, Berlin. International Convention date, March 2, 1929.

Synthetic resins are obtained by condensation of azelaic acid with glycerol, *e.g.*, by heating with or without condensing agents such as hydrochloric acid and, if desired, solvents. Part of the glycerol may be replaced by glycol, propyl alcohol or other monohydric or polyhydric alcohols, and part of the azelaic acid by succinic, phthalic, pelargonic, salicylic or other monobasic or polybasic acids. The products may be hardened by heating for 24 hours at 110° C. They are suitable for use as ingredients of lacquers or of plastic and other compositions employed for impregnating or coating fabrics, leather, etc.

348,604. Catalytic Oxidation. Selden Co., McCartney Street, Pittsburg, U.S.A., Assignees of A. O. Jaeger, Crafton, Pennsylvania, U.S.A. International Convention date, February 8, 1929.

To prevent excessive oxidation in the catalytic vapour-phase oxidation of aromatic compounds an addition is made to the reaction mixture of hydrogen or of an organic compound which is more readily oxidised than, and is not a homologue or an isomer of, the compound to be oxidised. Among the numerous oxidations specified are the production of (1) maleic and mesotartaric acids from benzene, phenol, phthalic anhydride, etc., by oxidation with air with addition of hydrogen, gasoline, methyl alcohol, or gases containing methane, (2) benzoic acid and benzaldehyde from toluene by oxidation with air with addition of methyl alcohol or gasoline, and (3) naphthalic anhydride from acenaphthene by oxidation with air with addition of gasoline.

348,632. Phthalic Acid Derivatives. E. G. Beckett, P. F. Bangham, J. Thomas, and Scottish Dyes, Ltd., Earl's Road, Grangemouth. Application date, November 15, 1929.

4-Chlorophthalic acid is obtained by chlorination of phthalic acid, its anhydride or its alkali salts, in presence of carbonates, bicarbonates, or acetates of sodium or potassium.

348,669. Catalytic Oxidation of Sulphur Dioxide. Selden Co., McCartney Street, Pittsburg, U.S.A., Assignees of A. O. Jaeger, Crafton, Pennsylvania, U.S.A. International Convention date, January 22, 1929.

A catalyst for use in the oxidation of sulphur dioxide to sulphur trioxide comprises a diluted or undiluted non-base-exchanging silicate or polysilicate of a catalytically active metal which has been prepared in solutions within the range between neutrality and a slight acidity to litmus. The silicates may be of the platinum metals, of metals of the fifth or sixth groups of the periodic system, or of any of the catalytic metals referred to in Specifications 286,708 and 296,048. (See The Chemical Age, Vol. XVIII, p. 463 and Vol. XIX, p. 400 respectively.) Materials rich in silica may be used as diluents and easily decomposable complex compounds, *e.g.*, of ammonia or cyanogen, or substances, such as starch or stearic acid, which may be readily removed or destroyed by heating or leaching, may also be incorporated. Numerous examples of the preparation of the catalysts are given. Reference has been directed by the Comptroller to Specifications 286,708 (above) and 159,508, 286,212, 294,975, 298,142, and 314,858. (See The Chemical Age, Vol. IV, p. 566, Vol. XVIII, p. 417, Vol. XIX, p. 323, Vol. XIX, p. 441, and Vol. XXI, p. 224 respectively.).

348,680. Dyes. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 11, 1930.

Azo dyes are obtained by coupling diazo components containing *o*-oxy, *o*-carboxy, salicylic, or other mordanting groups with aminophenylpyrazolone derivatives and treating the products with phosgene or thiophosgene. The dyestuffs so obtained give dyeings on cotton which become fast to washing and to light on after-treatment with heavy metal salts. In examples the dyestuffs, *o*- or *p*-aminosalicylic acid → 1-*m*- or -*p*-aminophenyl-3-methyl-5-pyrazolone or 1-*m*- or *p*-aminophenyl-5-pyrazolone-3-carboxylic acid or ester, are treated with phosgene. Diazotised *p*-aminobenzoyl-*o*-aminosalicylic acid and 4-nitro-2-aminophenol, and the nitrated diazo-compound of 1 : 2-aminonaphthol-4-sulphonic acid are also specified as diazo components, and the tetrazotised urea of 1 : 4-phenylene-diamine-2-carboxylic acid as a tetrazo component.

348,690. Destructive Hydrogenation. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 15, 1930. Addition to 247,584, 247,585, 249,493 (see The Chemical Age, Vol. XIV, pp. 462 and 550), 272,832, and 273,228.

The destructive hydrogenation of carbonaceous materials is effected at 250° C. or higher and under at least 20 atmospheres pressure in presence of catalysts obtained by treating oxides of metals of the second and sixth groups of the periodic system with volatile compounds of sulphur, selenium and tellurium at elevated temperatures, *e.g.*, 400-500° C., in presence of hydrogen but in absence of hydrocarbons which are not gaseous under normal conditions. Specified volatile compounds are hydrogen sulphide, selenide or telluride, carbon bisulphide, mercaptans, thiophene, alkyl sulphur compounds and thio-ethers. The activity of the catalytic material may be maintained by the addition to the hydrogenating gas, in a predetermined concentration, of a volatile compound of the negative element of the catalyst.

348,705. Radioactive Preparations. Deutsche Gasgluhlicht-Auer Ges., 16, Rotherstrasse, Berlin. International Convention date, March 6, 1929.

Radioactive agents are precipitated upon adsorbents such as metal hydroxide gels and the precipitate is washed with a liquid in which the radioactive compound is less soluble than in water. Thus a solution containing iron chloride and radium chloride may be precipitated with ammonium carbonate, the precipitate being then washed with ammonium carbonate solution or with a suitable organic liquid. No appreciable loss of radium occurs during washing even when the atomic ratio of radium to iron is as high as 1 to 16.

348,721. Regeneration of Catalysts. H. D. Elkington, London. From Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague. Application date, February 21, 1930.

Catalysts, such as iron, cobalt, nickel, manganese, chromium, tungsten, uranium, or the oxides of these metals, which have been used for treating coal, oil or other carbonaceous materials with hydrogen or other reducing gases are regenerated by heating them in an oxidising atmosphere, *e.g.*, in air or oxygen, with or without admixture of steam or carbon dioxide.

348,724. Basic Titanium Sulphates. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 21, 1930. Addition to 346,009. (See The Chemical Age, Vol. XXV, p. 39.)

Solutions of basic titanium sulphate are obtained by precipitating part of the sulphuric acid from solutions of titanium sulphate as a difficultly soluble sulphate and removing the latter. The solutions so obtained may be evaporated *in vacuo*. Suitable precipitants are benzidine and carbonates of calcium, barium, strontium or lead. Part only of the requisite amount of sulphuric acid may be precipitated, sodium hydroxide or carbonate being then added to obtain the required basicity. Alternatively the alkali may be added before the precipitant

348,738. Active Charcoal. Maximine Soc. Anon., 4, Rue de la Cite, Verviers, Belgium. International Convention date, February 25, 1929.

Finely pulverised organic matter is subjected to hydrolysis with sulphuric or hydrochloric acid, preferably under pressure, until complete or almost complete dissolution is obtained, and the mass is then heated, first at atmospheric pressure and then under 3–5 atmospheres at a relatively low temperature (200–300° C.). Thus finely pulverised cellulose may be added to a concentrated zinc chloride solution containing a little hydrochloric acid, and the mixture be heated to evaporate excess of water, the resulting mass being then heated under pressure to 200° C., cooled, and freed from zinc chloride and acid. When sulphuric acid is used for the hydrolysis, a sulphate, *e.g.*, potassium bisulphate, is dissolved in the acid to keep the reacting mass in the liquid state. The product is a colloidally active charcoal in the state of an extremely fine sol. It is maintained in its moist state and used in the form of a paste having a water content of 80–90 per cent.

348,758. TREATING DOLOMITE. Soc. de Produits Chimiques des Terres Rares, 129, Avenue des Champs Elysées, Paris. International Convention date, March 11, 1929.

Chlorination of roasted dolomite is effected in two stages. In the first stage calcium is removed as soluble chloride, and in the second stage magnesium is removed as a chloride free from gangue and insoluble impurities. Thus the roasted material may be boiled with the requisite amount of ammonium chloride to remove the calcium as chloride, the ammonia evolved being used together with carbon dioxide from the roasting operation for treatment of this calcium chloride to obtain calcium carbonate with regeneration of ammonium chloride for use again. The residue containing magnesia with impurities is then treated with hydrochloric acid and magnesium chloride is crystallised from the solution obtained. The crystals may be dehydrated and electrolysed to obtain magnesium and chlorine. Alternatively, the first treatment of the roasted material may be with hydrochloric acid to obtain the calcium chloride, the residue being then treated with ammonium chloride to form the magnesium chloride.

Specifications Accepted with Date of Application

354,177. Steel capable of resisting rust and corrosion. R. Kesselring and J. Nowak. March 30, 1929.

354,181. Valuable hydrocarbons, Manufacture and production of by destructive hydrogenation. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). April 28, 1930.

354,184. Hormone preparations, Production of. Pharmagans Pharmaceutisches Institut L. W. Gans Akt.-Ges. April 30, 1929.

354,196. Polyhydric alcohols, Manufacture and production of. J. Y. Johnson. (*I.G. Fabenindustrie Akt.-Ges.*). May 1, 1930.

354,198. Concentration of dilute aliphatic acids. H. Dreyfus. May 2, 1930.

354,199. Aliphatic anhydrides, Manufacture of. H. Dreyfus. May 2, 1930. Addition to 279,916.

354,201. Sulphonation of aromatic amines. Imperial Chemical Industries, Ltd., M. F. S. Choate, S. Coffey, and C. R. Henshaw. May 2, 1930.

354,202. Aluminium-copper light-metal alloys. O. Kamps. May 2, 1930.

354,207. Collection of sulphur. D. Tyrer and Imperial Chemical Industries, Ltd. May 3, 1930.

354,216. Alloys of palladium, silver, and copper. International Nickel Co., Inc. January 28, 1929.

354,217. Wetting, cleansing, and dispersing agents, and preparations containing the same, Manufacture and production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). February 5, 1930.

354,226. *m*- and *p*-Hydroxyphenyl-*N*-methylaminoethanol-1, Process for preparing. Dr. H. Legerlotz. April 25, 1930.

354,239. Alloys of palladium, silver, and copper. International Nickel Co., Inc. January 28, 1929.

354,255. Industrial treatment of leucite, or of aluminous potassic and sodic silicates, or of natural and artificial alums, for the purposes of obtaining pure alumina, compounds of potassium or sodium and silica. G. Gallo. May 1, 1930.

354,302. Purification of gas and manufacture of fertilisers. L. Mellersh-Jackson. (*Soc. Belge d'Electro-Synthese Sobelsyn Soc. Anon.*). February 25, 1930.

354,307. Fertilisers, Production of. W. K. Hall and Imperial Chemical Industries, Ltd. March 31, 1930.

354,308. Styrol, Process of making. Naugatuck Chemical Co. April 20, 1929.

354,313. Ammonia-soda process. Union Chimique Belge Soc. Anon. May 7, 1929.

354,323. Vat dyestuffs, Treatment of. S. Thornley, R. F. Thomson, J. Thomas, and Scottish Dyes, Ltd. January 30, 1930.

354,334. Deresinification of waxes containing alcohols of high molecular weight or of alcohols obtained therefrom. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). March 3, 1930.

354,351. Manufacture of catalytic masses and their employment in organic reactions. British Celanese, Ltd., H. F. Oxley, W. H. Groombridge, and E. B. Thomas. May 2, 1930.

354,352. *N*- substituted-5 : 6-dialkoxy-8-aminoquinolines, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*). May 2, 1930.

354,357. Hydroxyalkyl compounds, Manufacture and production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) May 6, 1930.

354,387. Chromium or alloys thereof, Manufacture of. General Electric Co., Ltd., and C. J. Smithells. May 10, 1930.

354,388. Aldehydes and ketones, Manufacture and production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). May 10, 1930.

354,392. Hydroxydiphenylindole derivatives, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*). May 10, 1930.

354,395. Concentration of cassiterite ores and the like. E. J. Lawrence and J. A. Daniel. July 24, 1930.

354,451. Potash and soda, Production of. Chemieverfahren-Ges. July 13, 1929.

354,478. Refined lubricating oils from heavy hydrocarbon oils by treatment with hydrogen at high temperatures and pressures, Process for obtaining. Standard Oil Development Co. July 22, 1929.

354,485. Azo dyestuffs insoluble in water, Manufacture of. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*). June 21, 1930.

354,500. Catalytic preparations and their applications. Imperial Chemical Industries, Ltd. (*E. I. du Pont de Nemours and Co.*). June 27, 1930.

354,520. Hydrogen peroxide, Manufacture of. H. E. G. Rowley. (*J. D. Riedel-E. de Haen Akt.-Ges.*). July 12, 1930.

354,553. Dehydrating alcohol, Process of. Kodak, Ltd. August 29, 1929.

354,582. Treatment of hydrocarbon oils with liquid sulphur dioxide. Edeleanu Ges. February 12, 1930.

354,604. Metallic cyanates, Manufacture and production of. J. Y. Johnson. (*I.G. Fabenindustrie Akt.-Ges.*). September 25, 1930.

354,607. Regeneration of sulphides of the alkali or alkaline earth metals. Courtaulds, Ltd., and H. J. Hegan. September 27, 1930.

354,611. Iodized yeast, Manufacture and production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). October 6, 1930.

354,642. Hydrate dextrose from high purity solutions, Manufacture of. International Patents Development Co. November 14, 1929.

354,650. Mixed hydrocarbon gas and water gas, Manufacture of. Humphreys and Glasgow, Ltd. December 19, 1929.

Applications for Patents

[*In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.*]

Carpmael, A. (*I.G. Farbenindustrie Akt.-Ges.*). Manufacture of arsenic compounds. 23,170. August 17.

—— Manufacture of diarylene sulphides. 23,284. August 18.

—— Manufacture of therapeutically-active complex metal compounds. 23,402. August 19.

Du Pont de Nemours and Co., E. I. Manufacture of dyes. 23,118. August 17. (United States, August 15, 1930.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of aromatic hydrocarbons. 23,169. August 17. (Austria, August 16, 1930.)

—— Manufacture of viscose. 23,251. August 18. (Germany, August 18, 1930.)

—— Manufacture of artificial materials from fibroin solutions. 23,253. August 18. (Germany, August 18, 1930.)

—— Obtaining and separating physiologically-active substances from placenta. 23,366. August 19. (Germany, August 20, 1930.)

—— Printing-device for sound-films. 23,483. August 20. (Germany, August 20, 1930.)

—— Manufacture of sheets, etc., from cellulose derivatives. 23,562. August 21. (Germany, August 22, 1930.)

Imperial Chemical Industries, Ltd. Manufacture of printing-inks. 23,351. August 19.

Johnson, J. Y. (*I.G. Farbenindustrie Akt.-Ges.*). Manufacture of violet pigments. 23,547. August 21.

Kunzer, H. Aqueous lecithin compositions. 23,607. August 21.

Lonza Elektrizitätswerke und Chemische Fabriken Akt.-Ges. Production of alumina from alkaline earth aluminates. 23,200. August 18. (Switzerland, August 21, 1930.)

Lonza-Werke Electrochemische Fabriken Ges. Production of alumina. 23,198. August 18. (Switzerland, August 12, 1930.)

—— Production of alumina from alkaline earth aluminates. 23,199. August 18. (Switzerland, September 12, 1930.)

Manchester Oxide Co., Ltd., and Skirrow, F. W. Purification of sulphur. 23,197. August 18.

Mentzel, A. Manufacture of alkali carbonate or hydroxide, etc. 23,598. August 21. (Germany, August 26, 1930.)

Naamlooze Vennootschap Nederlandsche Gutta-Percha Mij in Liquidation. Obtaining rubber in granular form from latex. 23,600. August 21.

Pfizer and Co., C. Preparing hydrated citric acid. 23,390. August 19. (United States, July 15.)

Whitaker, A. Hydrogenation of carbonaceous substances. 23,623. August 21.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£17 15s. per ton d/d address U.K. in casks.
ACID CHROMIC.—11d. per lb., less 2½% d/d U.K.
ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.
ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.
ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
AMMONIA (ANHYDROUS).—Spot, 10d. per lb., d/d in cylinders.
AMMONIUM BICHROMATE.—8½d. per lb. d/d U.K., or c.i.f. export
BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.
BLEACHING POWDER, 35/37%.—Spot, £7 19s. per ton d/d station in casks, special terms for contracts.
BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards.)
CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d station in drums.
CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.
CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 12s. 6d. per ton d/d U.K.
COPPER SULPHATE.—£25 to £25 10s. per ton.
METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 11d. to 2s. 4d. per gall.; pyridinised industrial, 2s. 1d. to 2s. 6d. per gall.; mineralised, 3s. to 3s. 4d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.
NICKEL SULPHATE.—£38 per ton d/d.
NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
POTASH CAUSTIC.—£30 to £33 per ton.
POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4¼d. per lb. nett d/d U.K., discount according to quantity: ground ½d. per lb. extra
POTASSIUM CHLORATE.—3¾d. per lb. ex-wharf, London, in cwt. kegs.
POTASSIUM CHROMATE.—8½d. per lb. d/d U.K., or c.i.f. export.
SALAMMONIAC.—Firsts lump, spot, £40 17s. 6d. per ton d/d address in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.
SALT CAKE, UNGROUND.—Spot, £3 10s. per ton d/d station in bulk.
SODA ASH, 58%.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.
SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE 97/98%.—£21 per ton.
SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.
SODIUM BICHROMATE CRYSTALS (CAKE AND POWDER)—3½d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.
SODIUM BISULPHITE POWDER, 60/62%.—£16 10s. per ton delivered 1-cwt. iron drums for home trade.
SODIUM CHLORATE.—2¾d. per lb.
SODIUM CHROMATE.—3¾d. per lb. d/d U.K., or c.i.f. export.
SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.
SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.
SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d.
SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton, d/d in drums. Crystals—Spot, £8 5s. per ton, d/d in casks.
SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4¾d. to 6¼d. per lb. Crude 60's 1s. to 1s. 1d. per gall. August/December.
ACID CRESYLIC 99/100.—1s. 9d. to 1s. 10d. per gall. B.P., 3s. 6d. per gall. 97/99.—Refined, 1s. 11d. to 2s. 2d. per gall. Pale, 98%, 1s. 7d. to 1s. 8d. Dark, 1s. 4d. to 1s. 4½d.
ANTHRACENE OIL, STRAINED (GREEN OIL).—4¼d. to 4¾d. per gall.
BENZOLE.—Prices at works: Crude, 5¼d. to 6¼d. per gall.; Standard Motor, 1s. to 1s. 1d. per gall. 90%.—1s. 1d. to 1s. 2d. per gall. Pure, 1s. 4d. to 1s. 5d. per gall.
TOLUOLE.—90%, 1s. 8d. to 1s. 9d. per gall. Pure, 1s. 10d. to 1s. 11d. per gall.
XYLOL.—1s. 7d. to 1s. 8d. per gall. Pure, 1s. 10d to 1s. 11d. per gall.
CREOSOTE.—Standard specification, for export, 5dd. to 5¼d. net per gall. f.o.b.; for Home, 3¾d. per gall. d/d.
NAPHTHA.—Solvent, 90/160, 1s. 3d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent, 90/190, 1s. to 1s. 2d. per gall.
NAPHTHALENE.—Purified Crystals, £10 per ton.
PITCH.—Medium soft, 52s. 6d. per ton, in bulk at makers' works.
PYRIDINE.—90/140, 3s. to 3s. 3d. per gall. 90/160, 3s. 3d. to 3s. 6d. per gall. 90/180, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID GAMMA.—Spot, 3s. 3d. per lb. 100% d/d buyer's works.
ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
ACID NAPHTHIONIC.—1s. 2d. per lb. 100% d/d buyer's works.
ACID NEVILLE AND WINTHER.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.
ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.
ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
BENZIDINE BASE.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1-ton lots.
m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.
p-CRESOL 34·5° C.—1s. 9d. per lb., in ton lots.
DICHLORANILINE.—2s. 5d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
DINITROBENZENE.—7½d. per lb.
DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7¾d. per lb.
DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
a-NAPHTHOL.—Spot, 1s. 9d. per lb. d/d buyer's works.
B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.
a-NAPHTHYLAMINE.—Spot, 10½d. per lb. d/d buyer's works.
B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.
o-NITRANILINE.—5s. 11d. per lb.
m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.
NITRONAPHTHALENE.—8½d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 6d. per lb. 100% d/d buyer's works.
o-TOLUIDINE.—Spot, 9½d. per lb., drums extra, d/d buyer's works.
p-TOLUIDINE.—Spot, 1s. 6d. per lb. d/d buyer's works.
m-XYLIDINE ACETATE.—3s. 3d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 5s. to £7 10s. per ton. Grey, £12 per ton. Liquor, 9d. per gall.
ACETONE.—£63 to £65 per ton.
CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.
IRON LIQUOR.—24°/30° Tw., 10d. to 1s. 2d. per gall.
RED LIQUOR.—16° Tw., 8½d. to 10d. per gall.
WOOD CREOSOTE.—1s. 9d. per gall., unrefined.
WOOD NAPHTHA, MISCIBLE.—2s. 9d. to 2s. 11s. per gall., according to quantity. Solvent, 3s. 9d. per gall.
WOOD TAR.—£4 to £5 per ton.
BROWN SUGAR OF LEAD.—£32 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 1d. per lb. according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.
ARSENIC SULPHIDE, YELLOW.—1s. 5d. to 1s. 7d. per lb.
BARYTES.—£6 to £7 10s. per ton, according to quality.
CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.
CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.
CARBON BLACK.—3d. to 4d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 6d. per lb.
INDIARUBBER SUBSTITUTES, WHITE.—4d. to 5½d. per lb.; Dark, 4d. to 4½d. per lb.
LAMP BLACK.—£28 per ton.
LITHOPONE, 30%.—£18 to £20 per ton.
SULPHUR.—£9 10s. to £13 per ton.
SULPHUR CHLORIDE.—4d. to 7d. per lb., according to quality.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
SULPHUR PRECIP. COMMERCIAL.—£40 to £45 per ton.
VERMILION, PALE OR DEEP.—6s. 2d. to 6s. 8d. per lb.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACETANILIDE.—1s. 4d. to 1s. 6d. per lb.

ACID, ACETIC, PURE, 80%.—£35 5s. per ton d/d address U.K. in casks.

ACID, ACETYL SALICYLIC.—2s. 7d. to 2s. 9d. per lb., according to quantity.

ACID, BENZOIC B.P.—1s. 10d. per lb., for synthetic product. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.

ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—10½d. per lb., less 5%.

ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.

ACID, MOLYBDIC.—5s. 3d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. for 28-lb. lots; Resublimed, 8s. 6d. per lb. for 28-lb. lots, d/d.

ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.

ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.

ACID, TARTARIC.—10½d. per lb., less 5%.

AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.

AMMONIUM BENZOATE.—3s. 6d. per lb.

AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.

AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.

ATROPHINE SULPHATE.—7s. to 7s. 6d. per oz., according to quantity.

BARBITONE.—5s. 9d. to 6s. per lb.

BENZONAPHTHOL.—2s. 1od. per lb.

BISMUTH CARBONATE.—7s. 9d. per lb.

BISMUTH CITRATE.—8s. 7d. per lb.

BISMUTH SALICYLATE.—7s. 11d. per lb.

BISMUTH SUBNITRATE.—6s. 9d. per lb.

BISMUTH NITRATE.—Cryst. 5s. 6d. per lb.

BISMUTH OXIDE.—10s. 9d. per lb.

BISMUTH SUBCHLORIDE.—10s. 5d. per lb.

BISMUTH SUBGALLATE.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.

BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb. Liquor Bismuth B.P., in W. Qts., 1s. 2½d. per lb.; 6 W. Qts., 1s. per lb.; 12 W. Qts., 10½d. per lb.; 36 W. Qts., 10d. per lb.

BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.

BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 4½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 7d. per lb. Prices for 1-cwt. lots.

CAFFEIN, PURE.—6s. 6d. per lb.

CAFFEIN CITRAS.—5s. per lb.

CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., according to quantity.

CAMPHOR.—Refined flowers, 2s. 8d. to 2s. 10d. per lb., according to quantity; also special contract prices.

CHLORAL HYDRATE.—2s. 11½d. to 3s. 1½d. per lb.

CHLOROFORM.—2s. 4d. per lb.

ETHERS.—S.G. ·730—1s. 1d. to 1s. 2d. per lb., according to quantity; other gravities at proportionate prices.

FORMALDEHYDE, 40%.—30s. per cwt., in barrels, ex wharf.

GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.

HEXAMINE.—1s. 10d. to 2s. per lb., according to quantity.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.

HYDROQUINONE.—4s. 7d. per lb. in 1-lb. lots; 3s. 5¾d. per lb. in cwt. lots.

HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; for 28-lb. lots.

IRON AMMONIUM CITRATE.—B.P., 1s. 9d. per lb., for 28-lb. lots. Green, 2s. 6d. per lb., list price. U.S.P., 2s. 7d. per lb. list price.

IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.

IRON QUININE CITRATE.—B.P., 8½d. to 8¾d. per oz.

MAGNESIUM CARBONATE.—Light B.P., 36s. per cwt.

MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.

MENTHOL.—A.B.R. recrystallised B.P., 14s. per lb. net; Synthetic, 8s. 6d. to 12s. per lb.; Synthetic detached crystals, 8s. 6d. to 9s. 9d. per lb., according to quantity; Liquid (95%), 8s. per lb.

MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 7s. 4d. to 7s. 5d. per lb., levig., 6s. 11d. to 7s. per lb.; Corrosive Sublimate, Lump, 5s. 10d. to 5s. 11d. per lb., Powder, 5s. 3d. to 5s. 4d. per lb.; White Precipitate, Lump, 5s. 10d. to 5s. 11d. per lb., Powder, 5s. 11d. to 6s. per lb.; Calomel, 6s. 3d. to 6s. 4d. per lb.; Yellow Oxide, 6s. 9d. to 6s. 10d. per lb.; Persulph, B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 6s. 5d. to 6s. 6d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 3d. to 1s. 4d. per lb.

PARAFORMALDEHYDE.—1s. 6d. per lb.

PARALDEHYDE.—1s. 1d. per lb.

PHENACETIN.—3s. 9d. to 4s. 1d. per lb.

PHENOLPHTHALEIN.—5s. to 5s. 2½d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—77s. per cwt., less 2½ per cent.

POTASSIUM CITRATE.—B.P., 1s. 7d. per lb. for 28-lb. lots.

POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.

POTASSIUM IODIDE.—16s. 8d. to 17s. 9d. per lb., as to quantity.

POTASSIUM METABISULPHITE.—50s. per cwt. d/dLondon, kegs free.

POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.

QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.

SACCHARIN.—43s. 6d. per lb.

SALICIN.—16s. 6d. to 17s. 6d. per lb., according to quantity.

SILVER NITRATE.—10d. per oz. for 500-oz. lots, sticks, 2d. per oz. extra.

SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.

SODIUM BENZOATE B.P.—1s. 6d. to 1s. 7½d. per lb.

SODIUM CITRATE.—B.P.C. 1911, 1s. 4d. per lb. B.P.C. 1923, and U.S.P., 1s. 8d. per lb. for 28-lb. lots.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. per cwt. net. Crystals, 2s. 6d. per cwt. extra.

SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.

SODIUM SULPHITE, ANHYDROUS.—£26 to £28 per ton, according to quantity. Delivered U.K.

STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.

TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.

THYMOL.—Puriss, 6s. 1½d. to 7s. per lb., according to quantity. Natural, 12s. per lb.

ZINC STEARATE.—1s. 4d. to 1s. 6d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.

AUBEPINE (EX ANETHOL).—8s. 9d. per lb.

AMYL ACETATE.—2s. 3d. per lb.

AMYL BUTYRATE.—4s. 9d. per lb.

AMYL CINNAMIC ALDEHYDE.—8s. 6d. per lb.

AMYL SALICYLATE.—2s. 6d. per lb.

ANETHOL (M.P. 21/22° C.).—5s. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE ALCOHOL.—1s. 9d. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 9d. per lb.

BENZYL BENZOATE.—2s. 2d. per lb.

CINNAMIC ALDEHYDE NATURAL.—10s. 6d. per lb.

COUMARIN.—12s. per lb.

CITRONELLOL.—7s. 3d. per lb.

CITRAL.—6s. per lb.

ETHYL CINNAMATE.—6s. 9d. per lb.

ETHYL PHTHALATE.—2s. 6d. per lb.

EUGENOL.—7s. 6d. per lb.

GERANIOL.—6s. to 10s. per lb.

GERANIOL (FROM PALMAROSA).—14s. per lb.

HELIOTROPINE.—5s. 6d. per lb.

ISO EUGENOL.—9s. per lb.

LINALOL (EX BOIS DE ROSE).—5s. 6d. per lb.

LINALYL ACETATE, EX BOIS DE ROSE.—7s. 6d. per lb. Ex Shui Oil, 7s. 6d. per lb.

METHYL ANTHRANILATE.—6s. per lb.

METHYL BENZOATE.—4s. 3d. per lb.

MUSK XYLOL.—6s. 6d. per lb.

PHENYL ETHYL ACETATE.—10s. per lb.

PHENYL ETHYL ALCOHOL.—8s. 3d. per lb.

RHODINOL.—40s. per lb.

SAFROL—1s. 6d. per lb.

VANILLIN, EX CLOVE OIL.—14s. 6d. to 16s. 6d. per lb. Ex Guaiacol.—13s. to 15s. per lb.

Essential Oils

ANISE OIL.—2s. 6d. per lb.

BERGAMOT OIL.—8s. 6d. per lb.

BOURBON GERANIUM OIL.—17s. 6d. per lb.

CAMPHOR OIL.—White, 100s. per cwt.; Brown, 100s. per cwt.

CANANGA.—Java, 7s. per lb.

CINNAMON OIL LEAF.—4s. per oz.

CITRONELLA OIL.—Java, 2s. 6d. per lb., c.i.f. Pure Ceylon, 2s. per lb.

CLOVE OIL, 90/92%.—6s. per lb.

EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%—1s. 4d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, 9s. per lb.

LEMON OIL.—4s. 3d. per lb.

LEMONGRASS OIL.—2s. 9d. per lb.

ORANGE, SWEET.—8s. per lb.

OTTO OF ROSE.—Anatolian, 40s. per oz.; Bulgarian, 60s. per oz.

PALMA ROSA.—8s. 9d. per lb.

PEPPERMINT.—Wayne County, 8s. per lb.

PETITGRAIN.—5s. 9d. per lb.

SANDALWOOD.—Mysore, 28s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, August 26, 1931.

THERE has been a quiet steady trade during the current week with prices on the whole unchanged.

General Chemicals

ACETONE.—Still remains at £60 to £63 per ton, according to the quantity, with the market ruling steadily.

ACID ACETIC.—Continues in good request at £34 5s. to £36 5s. per ton for technical 80%, and £35 5s. to £37 5s. per ton for pure 80%.

ACID FORMIC.—Unchanged at £37 per ton and there has been a fair amount of business placed.

ACID CITRIC.—Is unchanged at about 10½d. per lb. and only a small business is being placed.

ACID LACTIC.—In steady demand at £38 per ton for 40% weight material at which figure the market is steady.

ACID OXALIC.—The market is firm at £34 per ton for material in casks, and £35 per ton for 1-cwt. kegs, carriage paid.

ACID TARTARIC.—In quiet request at about 10¼d. to 10½d. per lb., less 5%.

ALUMINA SULPHATE.—In steady request at £7 5s. to £8 3s. for 17/18% iron free quality.

ARSENIC.—There is no change in the position, English material still being in short supply and the price nominal at about £20 per ton. There is rather more supply of imported material arriving with the price steady at about £19 to £19 10s. per ton.

CREAM OF TARTAR.—Is in quiet request at about 76s. to 77s. per cwt., ex store London.

COPPER SULPHATE.—Is slightly cheaper at about £18 10s. per ton, with a small demand.

FORMALDEHYDE.—Is steady at about £27 per ton, with rather larger demand than in the past.

LEAD ACETATE.—Is in quiet request at £31 5s. per ton for white, and £30 15s. per ton for brown.

LITHOPONE.—In steady request at £18 to £22 per ton, according to grade and quantity, and there is a fair demand.

POTASSIUM BICHROMATE.—Unchanged at 4¼d. per lb., with the usual discounts for contracts, and there is a steady demand.

POTASSIUM CHLORATE.—Unchanged at £28 to £32 per ton and there is a fair demand.

PERMANGANATE OF POTASH.—Continues steady at 5¼d. to 5½d. per lb., ex warehouse London, for needle crystals, B.P. quality.

SODA BICHROMATE.—Unchanged at 3½d. per lb., with usual discounts for contracts, and there is a small demand.

SODA HYPOSULPHITE.—Photographic crystals in better request at about £14 5s. per ton, and commercial crystals at £8 10s. per ton.

SODA PRUSSIATE.—Fairly steady at 4½d. to 5¼d. per lb., according to quantity.

TARTAR EMETIC.—In small demand at about 10½d. per lb.

ZINC SULPHATE.—At £10 10s. per ton, with a slightly better demand.

Coal Tar Products

THERE is no change to report in the coal tar products market, and prices are unaltered from last week.

MOTOR BENZOL.—Obtainable at about 1s. 4½d. to 1s. 5½d. per gallon, f.o.r.

SOLVENT NAPHTHA.—Remains at about 1s. 1½d. to 1s. 2d. per gallon, f.o.r.

HEAVY NAPHTHA.—Quoted at about 11d. to 1s. 0½d. per gallon, f.o.r.

CREOSOTE OIL.—Unchanged at about 3d. to 3½d. per gallon, f.o.r., in the North, and at about 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Remains at about 1s. 8d. per gallon for the 98/100% quality, and at about 1s. 6d. per gallon for the dark quality, 95/97%.

NAPHTHALENES.—Quoted at about £3 10s. to £3 15s. per ton for the firelighter quality, at about £4 to £4 5s. per ton for the 74/76 quality, and at about £5 per ton for the 76/78 quality.

PITCH.—Remains at 45s. to 47s. 6d. per ton, f.o.b. East Coast port, for forward delivery.

Nitrogen Fertilisers

Sulphate of Ammonia.—Export.—During the week offerings of sulphate of ammonia continued in considerable volume, and the market weakened to about £5 per ton, f.o.b. U.K. port, in single bags. The market still appears to be unsettled. *Home.*—It is understood that a very large number of merchants have covered their requirements of sulphate of ammonia at the price of £5 10s. per ton, delivered farmers' nearest station in 6-ton lots. There appears little likelihood of an early change in this price.

Nitrate of Soda.—Buyers are still eagerly awaiting prices for the present season. Until prices are announced business will be at a standstill in this product.

Latest Oil Prices

LONDON, August 26.—LINSEED OIL was easier on more pressing offers due to the Argentine bearish estimate of the area sown to linseed. Spot, £16 15s. per ton, ex imll; September, £14; September to December, £14 2s. 6d.; January to April, £15, paid and sellers. RAPE OIL and COTTON OIL unchanged. TURPENTINE unchanged with a slow trade.

HULL.—LINSEED OIL, spot and August, closed at £14 10s., naked; September to December, at £14 12s. 6d.; January to April, at £15 5s. COTTON OIL.—Egyptian, crude, spot, £18 10s.; edible, refined, spot, £20 15s.; technical, spot, £20 10s.; deodorised, £22 15s. PALM KERNEL OIL, crude, naked, f.m.q., spot, £19. GROUND NUT OIL, crushed/extracted, spot, £24 10s.; deodorised, £28 10s. RAPE OIL, crushed/extracted, spot, £25; refined, £27. SOYA OIL, crushed/extracted, spot, £17; deodorised, £20 10s. per ton. COD OIL, 17s. per cwt. CASTOR OIL, Pharmacy, spot, 40s. 6d.; firsts, 35s. 6d.; seconds, 33s. 6d. per cwt. TURPENTINE, American, on the spot, 40s. per cwt.

South Wales By-Products

THERE is very little change in South Wales by-products activities. Business generally is slow and uncertain, and the immediate outlook is not favourable. Pitch continues to have a quiet market, most of the big users confining their purchases to small, near-date delivery orders. Quotations are unchanged. Road tar is not quite so good, but quotations are unchanged round about 13s. per 40-gallon barrel delivered. Refined tars have a fair call, with values unchanged for gasworks and coke-oven tar. Naphthas remain quiet, with no change in values. Motor benzol has a fair and steady call, but creosote remains weak. Patent fuel and coke exports are slightly better, but are still far from satisfactory. Patent fuel prices, for export, are:—19s. 9d. to 20s., ex-ship, Cardiff; 19s. to 19s. 6d. ex-ship Swansea. Coke prices are:—Best foundry, 32s. 6d. to 36s. 6d.; good foundry, 22s. 6d. to 25s.; furnace, 16s. 6d. to 17s. 6d.

Scottish Coal Tar Products

WHILE market conditions at present do not show any material improvement the price tendency is towards a rise. Supplies of crude tar are below normal and consequently the resultant products are not so plentiful. In addition, buyers are again taking a longer view of the market.

Cresylic Acid.—More inquiries are in circulation, but prices are unchanged. Pale, 99/100%, 1s. 5d. to 1s. 6d. per gallon; pale, 97/99%, 1s. 3d. to 1s. 4d. per gallon; dark, 97/99%, 1s. 2d. to 1s. 3d. per gallon; ex-makers' works. High boiling is firm at 2s. 6d. to 3s. per gallon.

Carbolic Sixties.—Stocks are comparatively high and value is nominal at 1s. 1d. to 1s. 3d. per gallon according to percentage of water.

Creosote Oil.—A fair volume of business is being arranged and some contracts have been placed for many months forward. Specification oils, 2½d. to 3d. per gallon; washed oil, 3¼d. to 3½d. per gallon; gasworks ordinary, 3½d. to 3¾d. per gallon; all f.o.r. makers' works in bulk quantities.

Coal Tar Pitch.—Indications are firm but, stocks being low, distillers are disinclined to commit themselves for forward delivery. Quotations are about 45s. per ton f.o.b. Glasgow for export, and about 40s. per ton at works for home trade.

Blast Furnace Pitch.—In moderate call at 30s. per ton f.o.r. works for home trade, and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—Throughput is well maintained and value is steady at 2½d. to 2¾d. per gallon, f.o.r. makers' work naked.

Blast Furnace Tar.—Quiet at 2¾d. per gallon f.o.r.

Crude Naphtha.—Supplies being scarce value is steady at 4¼d. to 5¼d. per gallon, according to quality.

Water White Products.—Few orders are being placed and quotations are irregular. Motor benzol, 1s. 2½d. to 3s. 3½d. per gallon; 90/160 solvent, 1s. 1½d. to 1s. 2½d. per gallon; and 90/190 heavy solvent, 11½d. to 1s. 0½d. per gallon; all f.o.r. in bulk.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, August 25, 1931.

THE uncertainties attendant on the political position have rather inclined buyers to hold off meantime, but it is hoped when things settle down that the market will brighten.

Industrial Chemicals

ACETONE.—B.G.S.—£60 to £63 per ton, ex wharf, according to quantity.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £45 to £56 per ton; pure, £35 5s. per ton; technical, 80%, £34 5s., delivered in minimum lots of 1 ton.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23 per ton; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered Great Britain free in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at 3½d. per lb., ex store. On offer from the Continent at 3¾d. per lb., ex wharf.

ACID, SULPHURIC.—£3 7s. 6d. per ton, ex works, for 144° quality, £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 11d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 10½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted round about £8 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 10s. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10½d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 80°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £26 per ton, ex wharf. On offer for shipment from China at about £23 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £23 10s. per ton, ex wharf Spot material still on offer at £24 per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £9 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £8 10s. per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 7s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £29 per ton, ex store. Continental on offer at about £27 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £30 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £38 per ton, carriage paid.

LEAD ACETATE.—White crystals quoted round about £32 to £34 per ton c.i.f. U.K. ports. Brown on offer at about £1 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £9 10s. per ton, ex store.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 2s. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4¼d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £24 10s. per ton ex store. Offered from the Continent at £23 10s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100% POWDER.—Quoted £26 15s. per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb. ex wharf

SODA, CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums; all carriage paid buyer's station, minimum four-ton lots; for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¾d. per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 7s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Price not yet fixed.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Price, 60s. per ton, ex works; 65s. per ton, delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £8 10s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

A Distinguished Langmuir Prizeman

DR. LINUS PAULING, who at thirty years of age has published nearly fifty papers in the field of pure science, and who has won a full professorship in the California Institute of Technology, has been chosen as the first winner of the A. C. Langmuir prize of the American Chemical Society. Professor A. A. Noyes, director of the Gates Chemical Laboratory of the Institute, described Pauling as the most promising young man with whom he had ever come in contact in his many years of teaching. Dr. A. C. Langmuir, sponsor of the prize of $1,000, called Pauling "a rising star, who may yet win the Nobel Prize." In singling out Pauling, he explained, American chemists, breaking with tradition, were honouring a scientist at the threshold instead of at the sunset of his career.

The work of Pauling, who will receive the award at the eighty-second meeting of the Society at Buffalo, on September 2, has had to do with crystal structure, the quantum theory of the dielectric constant of gases, atomic and molecular structure, and determination of the nature of chemical bonds. The Langmuir Prize, awarded for the first time this year, is bestowed "in recognition of the accomplishment, in America, of outstanding chemical research by a young man or woman preferably working in a college or university." It emphasises, according to the announcement, the debt industry owes to pure science. Dr. L. V. Redman, vice-president of the Bakelite Corporation, and president-elect of the American Chemical Society, was chairman of the jury of award.

Chemical Engineering at University College

THE new Ramsay Memorial Laboratory of Chemical Engineering is rapidly approaching completion, and it is anticipated that it will be ready for occupation in September. The staff of the department has been augmented by the appointment of Mr. M. B. Donald, A.R.C.Sc., M.Sc., as lecturer in chemical engineering. After graduating with first-class honours in chemistry at the Royal College of Science, Mr. Donald spent two years as a student in the Department of Chemical Engineering of the Massachusetts Institute of Technology. On his return to England he was lecturer in physical chemistry at the Royal College of Science for three years, and then went to the nitrate fields of Chile as senior research assistant in the chemical engineering department.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, August 27, 1931.

Due in a great measure to political developments, the atmosphere of the chemical market here during the past week has been rather less depressing, without, however, any appreciable improvement in the aggregate weight of business going through. Most of the demand this week, as it has been for some time, has been in respect of small to medium-sized parcels for almost immediate delivery, but in the ordinary course of events more active buying should be witnessed within the next few weeks, as the holidays come to an end. In the meantime, although the majority of prices keep reasonably steady, there is still a tendency here and there for values to move to slightly lower levels.

Heavy Chemicals

Bicarbonate of soda keeps very firm at about £10 10s. per ton, and on the whole a fair movement of this material is reported. Only a comparatively quiet business is being done in the case of chlorate of soda, but at £26 10s. per ton, prices keep up. Sulphide of sodium meets with a limited demand, with the 60–65 per cent. concentrated solid quality quoted at round £9 per ton and the commercial at £7 15s. Bichromate of soda is selling in moderate quantities, and values are maintained at 3½d. per lb., less 1 to 2½ per cent. Some inquiry has been in circulation for phosphate of soda, with quotations for the dibasic material ranging this week from about £10 to £10 10s. per ton. Moderate interest is being shown in the case of saltcake, which continues to be offered at from £2 15s. to £3 per ton. Caustic soda is well held, with contract offers at from £12 15s. to £14 per ton, according to quality. Prussiate of soda is steady at from 4¾d. to 5¼d. per lb., according to quantity, with business this week on rather quiet lines. Hyposulphite of soda has attracted limited attention, but values have been well held at up to £15 10s. per ton for the photographic material and round £9 5s. for the commercial. Alkali is a firm section, with offers at round £6 per ton, a moderate weight of business being put through.

No more than a quiet demand continues to be reported in respect of permanganate of potash, but prices keep up at about 5d. per lb. for the commercial grade and from 5¼d. to 5½d. for the B.P. Easiness is still a feature of the market for carbonate of potash, offers of which are no better than about £24 per ton, with inquiry on a restricted scale. Chlorate of potash is quiet, but reasonably steady at about £27 10s. per ton. Yellow prussiate of potash is in moderate request, and quotations are maintained at from 6¾d. to 7¼d. per lb. according to quantity. Caustic potash meets with a quiet demand and with quotations this week ranging from £27 to £27 10s. per ton. Bichromate of potash meets with a moderate inquiry, with values held on the basis of 4¼d. per lb., less 1 to 2½ per cent.

The demand for sulphate of copper is on a restricted scale still, and at about £18 per ton, f.o.b., quotations are weak and uncertain. Arsenic is firm on the relative scarcity of offers, with white powdered, Cornish makes quoted at from £23 to £23 10s. per ton, at the mines. No further change has occurred in the lead products, the white and brown acetates being quoted at about £32 10s. and £31 per ton, and nitrate at £28 10s., moderate sales being reported. The acetates of lime this week have been in slow demand, but at round £7 10s. per ton for the brown quality and £12 for the grey prices have kept up.

Acids and Tar Products

The recent downward trend in tartaric and citric acids has not yet apparently come to an end, for offers are now as low as 10½d. and 10¼d. per lb., respectively. Oxalic acid meets with a moderate inquiry at about £1 14s. 6d. per cwt., ex store. Acetic acid is steady at the recent reductions, with the 80 per cent. commercial product at £35 per ton and the technical glacial at £49.

Among the by-products, pitch is firm and in moderate inquiry on export account at from 47s. 6d. to 52s. 6d. per ton, f.o.b. Little interest is being shown in creosote oil, and prices are on the easy side from 3d. to 4¼d. per gallon, naked. Crude carbolic acid is fairly steady at about 1s. 3d. per gallon, naked, with crystals quiet at about 5¼d. per lb., f.o.b. Not much business is offering in the case of solvent naphtha, which is quoted at round 1s. 1d. per gallon, naked.

Company News

American Cyanamid Co.—The net operating profit for the year to June 30 last was $2,969,326, to which is added other income, etc., making $3,793,922. Deducting depreciation, interest, etc., the consolidated net income is $548,669. The total surplus at June 30 was $10,613,619.

Broken Hill Proprietary Co.—For the year ended May 31, 1931, the report states that the net profit was £83,257 (against £161,889), after providing £232,752 (£256,695) for depreciation, and £64,659 (£73,032) for debenture interest. After provision for all outstanding liabilities there remain liquid assets £466,563 in cash and other convertible stocks which, however, does not include interests in other companies, but is inclusive of reserve and insurance funds.

Pinchin, Johnson and Co., Ltd.—The directors have announced an interim dividend of 10 per cent., actual, less tax, on the ordinary shares, being at the same rate as last year. Last year the final dividend was cut by 7½ per cent., the total of 22½ per cent. comparing with 30 per cent. in previous years. Capital bonuses of 33⅓ per cent. and 10 per cent. were distributed in 1928 and 1929 respectively. The dividend now declared is payable on September 7, and warrants will be posted on that date.

Calico Printers' Association, Ltd.—A loss of £175,289, which is arrived at after charging £382,540 for maintenance, depreciation and repairs and renewals, etc., and which compares with a profit of £69,186 in the previous year, is reported by the directors for the year to June 30 last. After deducting £29,917 brought in, and crediting £250,000 transferred from reserve for equalisation of dividends and £50,000 from general reserve, and charging the year's dividend on the 5 per cent. cumulative preference shares, there remains £3,823 to be carried forward. As in the previous year, no ordinary dividend is proposed. The last payment on these shares was in 1928–29, when 5 per cent. was distributed.

Combined Steam Power and Heating

Notable Paper at the Laundry Congress

For all chemical and other industrial establishments using low pressure heating and process steam, the ideal method of operation is now well known to be combined power and heating, that is, using back-pressure or pass-out engines or turbines for generating power by the drop in the steam pressure without condensation, exhausting at any desired low pressure to the heating mains. On these lines an overall thermal efficiency of about 50–60 per cent. from the raw coal to the final place of use can be obtained, as against, say, 15–22 per cent. only for the average very large super-power station, and 12–14 per cent. with the large compound slow speed condensing mill engine.

In this connection a notable paper has been read by Mr. D. Adamson at the recent Annual Congress of the National Federation of Launderers, and the general conditions in a laundry or other textile establishment are very similar to those in a smaller chemical works. As typical of what can be accomplished, the author mentioned the case of a laundry in the North of England driven by gas engines, using town gas as fuel at a cost of £400 per annum, along with coal in a separate boiler for the heating steam. This installation was then reorganised on modern scientific lines, and a vertical "Belliss" high-speed back-pressure steam engine installed, with utilisation of all the exhaust for heating and boiling, with the result that the £400 spent every year on town gas was said to have been saved, while the total amount of coal used remained as before.

Belliss and Morcom, Ltd., are pioneers in the use of back-pressure high-speed engine operation without cylinder lubrication, and giving absolutely clean steam, which can therefore be passed into cold water direct, without the slightest trace of oil being conveyed to the process. This largely arose because it was stipulated by the Admiralty that all dynamo engines installed on warships must operate without internal lubrication, and as the result of detailed investigations, it was discovered that the use of bronze pistons and valve rings instead of the normal cast iron rings only caused about one-third of the friction with the cast iron cylinder walls, so that bronze rings without lubrication, as used in all these back-pressure engines, are equal to cast iron rings with lubrication.

Tariff Changes

ARGENTINA.—A Presidential Decree (No. 127), dated July 21, and to come into force thirty days after its publication in the "Boletin Oficial," fixes valuations for a large number of goods which were formerly dutiable on the basis of their declared value. In the section relating to chemicals, valuations are fixed for 50 items, including crude salicylic acid, asphalt varnish, crude chlorate of potash (coloured), fungicides (packed), lithopone, titanium oxide, turpentine substitute and tetrachloride of carbon.

AUSTRIA.—As a result of the enforcement, as from July 28, of the revised Commerical Treaties between Austria on the one hand and Hungary, Yugoslavia and Czechoslovakia on the other, which were signed on June 30, July 18 and July 22 respectively, the rates of Customs duty on certain goods imported into Austria from the United Kingdom (and other countries enjoying "most-favoured-nation" treatment in Austria) have been modified as indicated below :—

	Gold Kronen per 100 kilogs. Former Duty.	New Duty.
Non-fuming sulphuric acid	2·80	3·50
Ammonium hydroxide	3·60	4·50
Calcium carbide	16	20
Chloride of lime and hypochlorite of soda	3	4·50
Potash alum	2	4·70
Potato starch (including potato meal)	12	30
Wheat starch—pays the duty on wheat flour, increased by	4	8
Other starches and starch meals (except rice starch)	Free	24
Vegetable glue	12	35
Starch gum (dextrine and other substitutes for amylaceous gums)	17	41
Starch glue, size and similar amylaceous products :—		
Made from starch gum (dextrine)	10	38
Other starch glues	10	25
Zinc white	Free	5
Zinc gray (zinc oxide)	Free	8
Fatty emulsions not containing mineral oil, for tanning purposes	8	15

Chemical Trade Inquiries

These inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

ITALY.—An agent at Turin is desirous of obtaining the representation of British exporters of chemical products for rubber industries. (Ref. No. 191.)

SOUTH AFRICA.—The South African Railways and Harbours Administration is calling for tenders, to be presented in Johannesburg by September 7, for the supply of 72½ tons of antifriction grease. (Ref. B.X. 7,140.)

New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the registration of the following Trade Marks can be lodged up to September 19, 1931.

FUTURIST.—524,243. Class 1.—Paints and compositions in the nature of paints. Bituminous Compositions, Ltd., Victory Works, Railway Street, Grimsby; manufacturers.—July 10, 1931

STELIODE. 524,286. Class 1.—Chemical substances used in manufactures, photography, or philosophical research and anti-corrosives. May and Baker, Ltd., Garden Wharf, Church Road, Battersea, London, S.W.11; manufacturing chemists.—July 13, 1931.

LIVOGEN. 523,425. Class 3.—Chemical substances prepared for use in medicine and pharmacy. The British Drug Houses, Ltd., 16 to 30, Graham Street, City Road, London, N.1; wholesale druggists.—June 9, 1931. (By consent.)

New Companies Registered

BRIGHTMILLS CHEMICAL CO., LTD.—Registered August 22. Capital, £1,000 in £1 shares. To acquire the business carried on by G. N. Clegg as a chemical and soap manufacturer as the Brightmills Chemical Co., at Little Lever, near Bolton. Directors: G. N. Clegg, chemist, H. Clegg, E. Walkden. Solicitors: Reg. Clayton Platt and Co., Market Chambers, Radcliffe.

BRITISH VANILLIN CO., LTD., Victoria House, Southampton Row, London, W.C.1.—Registered as a private company on August 18. Nominal capital, £15,000 in £1 shares. The objects are to adopt an agreement with the Chemical Trust of Great Britain, Ltd., and to acquire the property comprised thereon, and to carry on the business of chemists, druggists, drysalters, oil and colourmen, importers and manufacturers of and dealers in pharmaceutical, medicinal, chemical, industrial and other preparations, etc. A subscriber: F. M. Buster, 12, The Valley Green, Welwyn Garden City, Herts.

KEIGHLEY LAND CO., LTD., Temple Buildings, Keighley, Yorks.—Registered as a "public" company on August 24. Nominal capital of £15,000 in £1 shares. The objects are to acquire the assets and liabilities (if any) of the Florida Syndicate, Ltd.; to adopt an agreement between the said Syndicate and A. de W. Whitley, to acquire any lands or mines in the U.S.A., Canada and elsewhere, containing or supposed to contain phosphates of lime or other phosphates; to carry on the business of miners and workers and winners of phosphates and other minerals, etc. Directors: R. Clough, W. A. Clough, A. de W. Whitley.

International Nitrogen Agreement

Denial of Resumed Negotiations

AN official denial of the report of resumed negotiations for an international nitrogen agreement has been announced by Imperial Chemical Industries. In their statement issued on Monday, August 24, they say :—

"An arrangement has been arrived at between the German and Belgian Governments by which modifications are made in certain commercial treaties between those countries, so that each Government is now free to prohibit the importation of all nitrogenous fertilisers. It is understood that both Governments have, in fact, prohibited the importation of all forms of nitrogen except under licence. Secondly, some of the leading representatives of the Chilean Nitrate industry have lately been in session in Brussels and have had informal conversations with representatives of the Belgian synthetic nitrogen industry in regard to home prices in Belgium for the coming season. There has been no resumption of negotiations for a general agreement, and in view of the causes of the rupture at Lucerne and the present situation, it is considered improbable that such negotiations will be resumed in the near future."

British Celanese Sinking Fund

HOLDERS of the 7½ per cent. convertible second mortgage bonds of British Celanese, Ltd., met in London on Thursday, August 20, to consider the proposal that the company should be given power to apply towards the fulfilment of its annual sinking fund any bonds already purchased and any bonds subsequently purchased by it in the market at a cost below 110 per cent. plus accrued interest. When the vote on the resolution in favour of the scheme was taken by a show of hands, there was a big majority in opposition. A poll was taken, however, and resulted in the adoption of the scheme by certificates valued at £1,556,800, against £176,700. Dr. Henri Dreyfus, who presided, announced that these figures were exclusive of the company's holding of £127,000, and represented, without these figures, a majority in favour of 88 per cent. of the bondholders.